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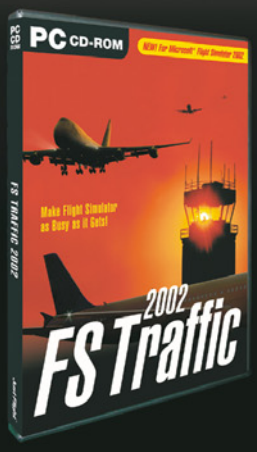
FS TRAFFIC 2002: REAL AIRLINES, REAL TRAFFIC



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Go back out on patrol in the two new Search and Rescue demos, and touch down at four airfields for CFS3. A beta of the forthcoming Eurofighter Typhoon from DSB designs is ready for testing, or try flying something a little more light-hearted from Shigeru Tanaka or a brace of Grob Tutors. Enjoy a selection of FS films, including Oleg Maddox giving us the lowdown on Forgotten Battles and Matt Wagner showing off Lock On, and try out some gorgeous freeware downloads.

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PC PILOT

THE CREW

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SUBMISSIONS

We will gladly accept and review for publication any letters, articles, photographs or other contributions. We cannot guarantee publication nor, regrettably, return items sent to us or be responsible for their loss. We will try and reply where possible. Any letters are assumed suitable for publication unless we are otherwise notified.

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247% less smug!

Editor's letter

Firstly, a very happy, peaceful and prosperous New Year to all our readers. A little late, perhaps, for such things, but it doesn't seem like five minutes since our lords and masters unchained us from our laptops long enough to enjoy a mince pie or two.

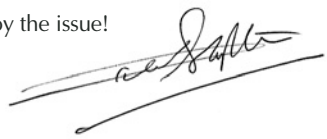
As is generally the case at this time of year, the larger commercial publishers are still gearing up for the New Year's activities and keeping their powder dry for when the FS enthusiast has at least made a dent in his credit card bill after Christmas. This is no bad thing, as there are more than enough smaller and no less talented developers out there releasing labour-of-love aircraft, freeware gems, scenery and utilities, many of which we've had a chance to enjoy over the last year. We've heard of a number of interesting add-ons due for release in the coming months, some of which no doubt won't get past the stage of being a wonderful idea, but it looks like we'll have plenty of fine FS products to keep us in front of our PCs in 2003.

The shelves of the mainstream games shops thankfully seem to be stocking a reasonable amount of FS software these days, and reviews of flight sim products in the games press and in real-world aviation magazines seems to be well on the increase. If it goes on like this, people will soon be taking us as seriously as those who use their PCs to fight the mutant forces of evil, create virtual families and friends, or guide unusually well-endowed young ladies through all manner of strange pixellated adventures!

We've included a survey form for UK readers in this issue which we hope will let us know the areas of flight simulation where your interests lie. We'd appreciate it greatly if you could spare a few minutes to fill it in and return it to us – we really do want to hear your comments. It won't cost you anything in postage, and we guarantee not to give your addresses to advertisers, marketing men or snake oil salesmen. With your feedback we'll do our very best to give you the features, reviews and articles that you want to read. If your form is missing, and you'd like to contribute, just drop us a mail and we'll gladly send you one.

Likewise, drop us a mail if you're an overseas reader who'd like to contribute, but unfortunately we can't provide a reply-paid service from outside the UK.

Enjoy the issue!



Dermot Stapleton
Managing Editor

COMMS

mail@pcpilot.net

FROM: Keith Hackett

Thanks for reviewing the Radeon 9700 PRO in Issue 20. One question that wasn't answered in the article is whether it improved blurred terrain in FS2002. I presently run an Athlon 2000XP with a GeForce2 MX 400 and 512Mb RAM, and find the blurring a bit irritating, especially now that I am running the VFR Photographic Scenery. I have tried the tool that ships with the VFR scenery but found that this didn't help much. I was wondering if the 9700 PRO would improve things in this respect.

Greg Gott replies:

The Radeon 9700 PRO has absolutely none of those texture rendering problems. In fact, the scenery textures are nothing short of breathtaking at times. Prior to testing, I had never experienced blurry textures with my GeForce4, so consequently that problem never entered my mind during the review of the 9700 PRO. That being said, I have recently rebuilt the GeForce4 system and, to my surprise, those 'blurries' have become apparent and indeed irritating! Since the review was written, ATI has released DirectX 9 drivers while Microsoft's DirectX 9 has become available as well. The board is simply astounding with the updated software behind it. With the Radeon 9700 PRO, you can say goodbye to the 'blurries' once and for all.

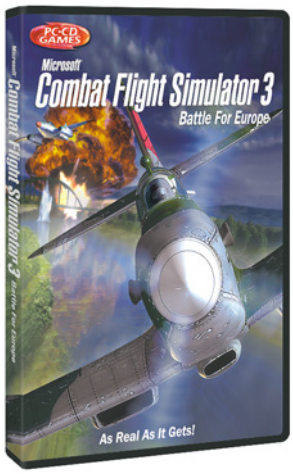
Third time unlucky?

FROM: Antony Leather

I had been eagerly anticipating the release of CFS3, and at long last Friday 15th came. I had it installed by 11am, and by 12 o'clock I was bored and very disappointed. It seems to me that Microsoft has lost the plot. This seemed to be more of a glorified shoot-'em-up than a sequel to CFS2, which actually looks much better visually in my opinion. The graphics are grainy and there is no comparison with FS2002. While the array of aircraft is impressive, on screen they somehow don't appear lifelike. I could go on but, putting it simply, IL-2 wipes the floor with this!

FROM: Geoff Browne

I've just purchased CFS3 and – guess what – it's awful. With an age-long install, and graphics reminiscent of first-generation flight sims, I feel this game (sorry, simulation) is a big disappointment. CFS2 was a superb re-creation of WWII Pacific aerial combat, fully justifying the term 'simulation', but the dreaded dumbing down seems to be rearing its ugly head once again. Having come to flight simming from the plastic modelling fraternity I have a penchant for historical accuracy, so seeing a Mosquito FB.Mk VI with the same canopy as a B.Mk IV is depressing. (Incidentally, Just Flight's Mosquito Squadron also has a number of glaring errors, such as two-tier rocket pylons and roundels under the wings.) Call me pedantic, but some simmers simply enjoy re-creating historical scenarios, which is where IL-2 seems to grow in stature every time I play it. How do they get all that amazing atmosphere on one disk? Incredible!



Low-level bombing…
and seemingly a low level of user satisfaction

We reply:

These are just a few of the many mails and letters we received after last issue's review of CFS3, and the majority unfortunately expressed a deep sense of disappointment. Tellingly, many of them also contrasted CFS3 with IL-2, and more than a few of those who wrote to us said they saw no reason to dispense with CFS2, with its numerous add-ons and its relatively undemanding graphics requirements. The fact that a forthcoming update to CFS3 was announced before Christmas would seem to indicate that Microsoft is aware of the extent of the general dissatisfaction with CFS3, at least among the hardcore FS buyers, but whether this will be enough to keep combat fans happy remains to be seen. Is there anyone out there who'd like to offer any unreserved praise for Microsoft's latest?

FROM: Dan Armstrong

I've bought CFS3 and given it a good blast; I've been running it on a high-spec machine so I've had a chance to put the graphics to the test – these are excellent. I also like the role play approach. However, I do have a few gripes. The gun stations aren't too bad but the modelling is very simple, and the whole thing has a very flat feel to it. As for the bullets, well, see IL-2. The warp is a little annoying; I preferred the instant warp in CFS2. All in all I think it's very good, but it's just a little too 'arcade-y' for my liking. Personally, I'd rather have waited another six months and paid a bit more for a truly outstanding piece of work. I'll be interested to see what IL-2 comes up with next.

Start 'em young!

FROM: Hywel Phillips

In Issue 20 you had a letter from a young Air Cadet asking if there was a Grob Tutor for FS2002. As an Air Cadet myself, I am enjoying flying Dave Garwood's excellent freeware aircraft released a few months ago.

FROM: John Braynion

The UK Defence Forces Virtual group (www.ukdfv.org) have in their Logistics section a Grob Tutor T1 by David Brice for download.

We reply:

Many thanks to all of you who took the time to write to us suggesting these aircraft. Both authors have very kindly agreed to let us include them on our cover CD – see the CD pages for more details. Our grateful thanks, Gentlemen!

Dave Garwood's Grob Tutor

FROM: Rod Younger

I had FS2002 Pro bought for me last March and I loved it, but it was only in July, when I saw and bought your magazine, that I realised how much more there actually is. I am not a computer techy or developer whiz, but I found that just by taking your advice, reading, trial and error (learning more from the errors), and taking a bit of time, it is actually quite easy (mostly). With all the freeware and shareware out there, I started to download quite a bit – some good, some not so good, and some absolutely fantastic. I now have (if no real life) over 15Gb of aircraft, scenery and utilities, all of which I have had to dabble with to get them to work properly. In short, if I can do it then anybody can, and it all started because I bought your magazine.

I would like to take this opportunity to thank all the people out there who design, develop, and write these programs, textures, scenery, aircraft and utilities; you all have a skill that I do not yet understand, but am very jealous of.

Thank you all at PC Pilot; without finding your magazine to start with none of this would have happened. I promise not to sue you all in my upcoming divorce (I only want custody of the PC).

We reply:

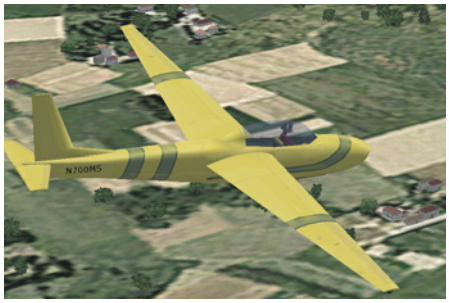
We're not sure whether to congratulate ourselves on another convert joining the FS ranks, or to offer our sympathies to your other half! One thing we'll agree with wholeheartedly is your praise for the talented developers out there and the superb array of downloads available. Flight simulation would certainly be much the poorer without their work.

FROM: Martin Littlewood

I took up gliding a while back, and went through all my back issues of PC Pilot, but have not seen any reviews of gliding sims. In a gliding magazine I found an advert for SFS 4, which is a dedicated gliding sim – how about a review? Do you know of any other glider sims?

We reply:

We'll admit to having rather neglected the gliding fraternity, but will be redressing the balance in following issues, when we'll be taking a proper look at how the soaring experience in FS2002 can be improved, Soaring Flight Simulator 4, Micro-Flight 3 and other gliding sims.



Coming soon…

NEWS

VFR hat-trick

The second and third volumes of Just Flight's VFR scenery have just been released and early signs are that they'll be as popular as the first one. Covering Central & Southern England and Wales & South-West England, both volumes include three CDs and will retail at £29.99. More details from www.justflight.com or www.getmapping.com.

Perfect Flight Super Cobra

Perfect Flight have released a new gmax-created combat chopper package for FS2002. The AH-1W Super Cobra is a two-seat twin-engined US Marine Corps attack/escort helicopter, which comes with a 2D panel and virtual cockpit. The 14Mb download version costs $14.50 (£9.00 approx.), and the CD is yours for $24.50 (£15.00 approx.). Order from http://www.fs2000.org.

MyTraffic on CD

This popular program for FS2002 is now available to buy on CD for a little more than the cost of the download version. Add some AI life to your airports and skies for €34.99 (£23.00 approx.) plus p&p. Anyone who's shied away from downloading the 86Mb program should visit www.simmarket.com to get their hands on the CD.

THE PILOT'S CHOICE

Don't let anyone tell you that airline pilots never have the time to read anything more interesting than checklists and flight manuals. We have firm photographic evidence, taken by freelance photographer Tamsin Zvereva and passed to us by reader Martin Hodgson, which shows that airline crews are among the world's most educated and well-read individuals. If you don't believe us, take a look at the accompanying photo, which we assure you wasn't staged!

CFS3 UPDATE

After monitoring feedback to the development team and forum postings, Microsoft has announced that there will be an update for CFS3. There's no doubt that the level of dissatisfaction with their latest WWII combat sim has been far higher than was anticipated, particularly with regard to graphics problems. Nothing was available as we went to press, so keep an eye on the Combat Flight Simulator Insider website at http://microsoftgamesinsider.com/CFSInsider for future announcements.

ANYONE GOT A LIGHT?

Microlight pilots should have plenty to keep them occupied over the coming months with the release of some new packages for FS2002. Those busy folk at Lago recently released a set of ten gmax-designed aircraft, ranging from the most basic to the most advanced, and including a hang-glider and paraglider in which you can simulate real launches by leaping off slopes and buildings. The download price is €15.00 (£10.00 approx.), and full details are at www.lagoonline.com.

Flight Sim Models (whose lovely little aircraft we reviewed in Issue 18) have teamed up with VIP to release the Challenger 2003 collection. This features eight variants of this hugely popular microlight, including clipped-wing models, ski-equipped and amphibious versions. Accurate Rotax sounds and four different panels complete the package, which is available from www.flightsimmodels.com for only $14.95 (£9.00 approx.).

Back to basics with Flight Sim Models

IRISH SCENERY

Irish Flight Sim Design

Thanks to the efforts of the Irish Flight Sim Design group, the Emerald Isle will shortly be looking a whole lot better. The team are in the final stages of developing a freeware scenery package, predominantly created with gmax, that will cover the whole of Ireland; the first release will include Dublin airport and city scenery, Belfast and Galway (Carnmore airport). Cork may make the Version 1.0 release, and Shannon is promised shortly. There's also a possibility that the project may extend into Northern Ireland. We're looking forward to the full release, but in the meantime enjoy the screenshots and read more about the project at www.ifsd.ie.

LEGENDARY 727 AT LAST

Captain Simulations got off to a flying start in 2003 with the release of their long-awaited Legendary 727 package on New Year's Day. It was expected to see the light of day a while back, but it looks very much as though all the waiting has been worthwhile, just as you'd expect from Alex Pogensky and his team of aviation and aeronautics professionals. The Standard package ($29.92, or £19.00 approx.) includes two gmax models for FS2002 – the Boeing 727-100 and a cargo version, and buyers of the Professional package ($36.95, or £23.00 approx.) also get two versions of the 727-200. An extra $9.00 gets your choice of software sent to you on CD.

The flight deck systems have been programmed according to the genuine Boeing manuals, and you'll have a First and Second Officer keeping you company in the cockpit. Enjoy eleven full-screen interior views and a crew voice package (Pro version only) that lets the crew members communicate with each other. A TCE (Textures and Config Editor) is provided to let you manage your fleet and simplify the adding of repaints and liveries, and there's also a 3D virtual cockpit. Full documentation and authentic sounds complete a stunning package. Feast your eyes on further screenshots and more information at www.captainsim.com/727.

LUFTWAFFE EXPERIMENTS ONLINE

Interest in experimental Luftwaffe aircraft designs has been revived lately by the inclusion of some of these exotic flights of fancy in CFS3, and anyone who'd like to find out more about this fascinating chapter in aviation history should head straight to Dan Johnson's excellent Luft '46 website (www.luft46.com). There's an ongoing project to catalogue all German aircraft projects from 1933-1945, a comprehensive list of manufacturers and their projects (complete with artwork and specifications where possible), artwork, models and more. If your interests lie in Blohm & Voss and Arado rather than Boeing and Airbus, find a place for Luft '46 in your Favourites folder.

Jozef Gatial's Me P.1079/1

TERMINAL BUILDING

Global Star Software, Canadian publisher of the Search & Rescue series, has announced that the sequel to the original 3D airport management sim, Airport Tycoon, will be released in February. Airport Tycoon 2 will allow players to oversee every aspect of building and operating a full-scale international airport. Airport Tycoon 2 is being developed by Sunstorm Interactive, and is likely to cost around £15.00. If you'd prefer to control the boardroom rather than the flight deck, ask your secretary to get the details from www.globalstarsoftware.com.

DirectX 9.0

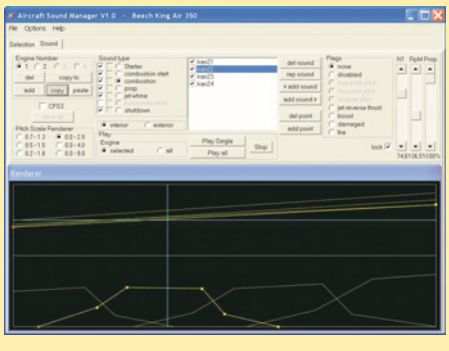
Shortly before Christmas Microsoft released DirectX 9.0 for Windows 98/ME/2000 and XP; it's well worth installing, particularly if you like to try out the latest demos or are a regular at online multiplayer sessions – and don't forget to update your video card drivers where possible. This new version of DirectX is backwards compatible, so installing it is unlikely to cause any problems with sims you've already installed. See Microsoft's website at http://www.microsoft.com/windows/directx/default.asp for full details, FAQs and the download.

EZ-Landmark updated

A free update for registered users of EZ-Landmark, Abacus's handy landmark-labelling program for FS2000/2002, is available from www.abacuspub.com/ezlandmark. Version 1.1 is faster to load and includes several new databases and support for multiple databases. If you're not familiar with the program, there's a 1.7Mb demo available on the website.

Sounds interesting...

All those who like their aircraft to sound as good as they look should investigate Aircraft Sound Manager (www.aircraftmanager.com) for FS2002 and CFS3. At the moment the program deals only with engine sounds, by way of a simple interface, but wind, ground and other sounds such as flaps and landing gear will be implemented soon. Detailed information and a demo version are available on the website; if you like what you see and hear, the full version costs €17.00 (£11.00 approx.).



Spanish simming

Some good news for Spanish FS enthusiasts – SimFlight has opened a new site, simFlight en Español, to keep Spanish speakers around the world up to date with all that's happening in flight simulation. Head to www.espanol.simflight.net to take a look.

Best of British

Just Flight has announced that they have signed an agreement with Gary Summons to publish his popular UK2000 airport series for Flight Simulator 2002. British Airports, as the series will be called, will initially consist of four volumes covering South-East, East, South & South-West, and Central England. Prices are expected to be £19.99 per volume and release is set for mid-March. Just Flight's Logistics Manager W.S. MacGregor said: "Gary's scenery has always proved extremely popular with flight simulation fans and we're very pleased to be publishing this fantastic collection."
Find out more at www.justflight.com.

Get online with GAME

Online flyers might want to keep an eye on a new service launched by GAME, the huge high-street games retailer. Billed as "an all-encompassing solution to online gaming", www.GAME.net allows access to a host of online games and sims, including at the moment CFS and CFS2, FS2000/2002, and IL-2. This new online service only launched on the 17th of January, so more supported titles are expected soon. You'll need the software, available from the site (or on CD from GAME shops in February), for an introductory £14.99 for a year's access. Well, £12.99 plus £2.00 for a GAME reward card. GAME are among the big hitters in shopping centres around the country, so it'll be interesting to see how they fare online.

Strike Fighters

Strike Fighters Skunk Works have been quick to take advantage of the combat jet sim's open architecture, and the site is already home to a growing number of files which add considerably to the official release. As well as modelling and mission building tutorials on the site, there are numerous aircraft in development, and skins, utilities and more already available for download from http://skunkworks.free.fr. It looks very much as if the anticipated Strike Fighters community is already up and running – good news for those of us in the UK, who should (fingers crossed!) be able to buy a patched version of Strike Fighters before long.

Another impressive website of interest to Strike Fighters pilots is Biohaz Central (www.biohazcentral.com), where you can download a 12Mb European Terrain tileset to replace those dull desert textures.

WIRELESS WINGS

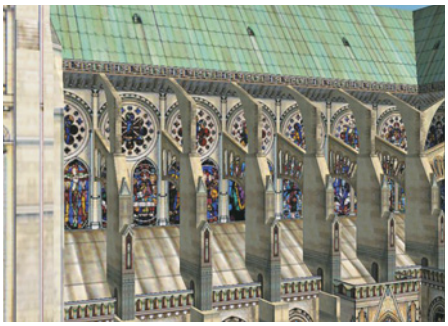
Before PC flight simulation was possible, flying radio controlled model aircraft was the way to get airborne without leaving the ground. Things have now come full circle and you can download a freeware RC aircraft simulation called PRE-Flight from www.users.bigpond.net.au/atv/preflight001.htm. It's designed to work with PRE-Flight's hardware interface – that's the box they use for controlling the aircraft. As well as realistic flight models and scenery it contains an aircraft design program, and should certainly be of interest to anyone who has dabbled with a soldering iron and a small two-stroke motor.

A CORGI CENTENARY

Die-cast model specialist Corgi is joining the celebrations to mark the 100th anniversary of flight in 2003 by releasing a new collection of pioneering and iconic aircraft that they hope will illustrate the changing face of aviation. The Aviation Archive contains a DC-3, Lockheed Constellation, D.H. Comet and Boeing 707. The new Showcase Collection will really stretch collector's pockets; from the Wright Brothers to the first moon landing, flying milestones are covered in a series of five themed categories which can be collected individually or in sets of four. Everything from the Wright Flyer and Bleriot XI to the F-16 and Vostock 1 is included. Be warned – a visit to www.corgi.co.uk could lead to open-wallet surgery!

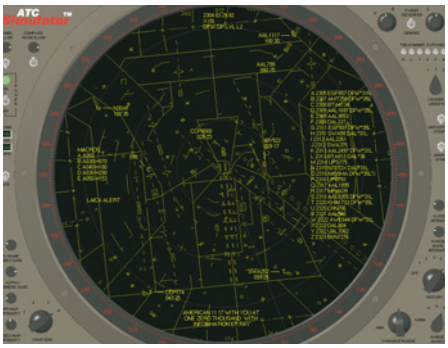
MONUMENTAL FRENCH SCENERY

Francophiles and historians should take a look at Christian Fonck's Monuments of France (Volume One) – Eastern scenery package for FS2002, available from www.flightworld.com. As well as detailed airports, there's a staggering number of monuments, chateaux, castles and memorials. It really is an amazing package for around £20.00; if you need any more convincing, just take a look at the stunning detail on Chartres cathedral.



ATC SIM REQUESTS CLEARANCE

Russell 'Brad' Davis, the genius behind ATC Simulator, recently announced that he has split with his publisher of many years, PC Aviator. When we originally reviewed ATC Simulator, which unsurprisingly simulates ATC from the controller's point of view, we found it fascinating but in need of more development. Brad has told us that the 1.5 version is much improved, with 'real' voices, and he is now working on 2.0 which he intends to publish himself from his website www.atcsimtech.com. Even if you aren't into simulated ATC, his site is worth a visit for its amusing observations and songs from the shows!



TORNADOES AND TIGERS

Lago currently have two innovative new products on the drawing board, expected to see the light of day in January 2003. Tiger Meet Falcon isn't spelled incorrectly – the title refers to F-16 Fighting Falcon pilots' mock battles and training exercises in their specially painted aircraft. Expect ten liveries, virtual cockpits, spectacular sounds and a realistic flight model. The aircraft will have a full weapons set in CFS3 (subject to the constraints of the host sim) and if you fly in FS2002 you'll be able to try your hand at in-flight refuelling while enjoying voice communication between your F-16 and the tanker.

Lago's Tornado release will also include in-flight refuelling, as well as a terrain following system. Expect Gulf War liveries and liveries from the various air forces who use the twin-engined monster.

No prices are currently available, but www.lagoonline.com will have more information as it's available.

www.RCSimulations.com

RailDriver

Drive your train simulation game or your model train with realistic throttle, brake, reverser, and switch controls, plus 34 programmable buttons.

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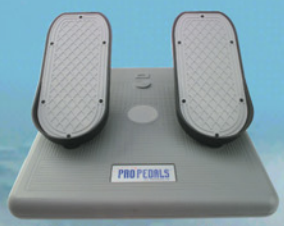

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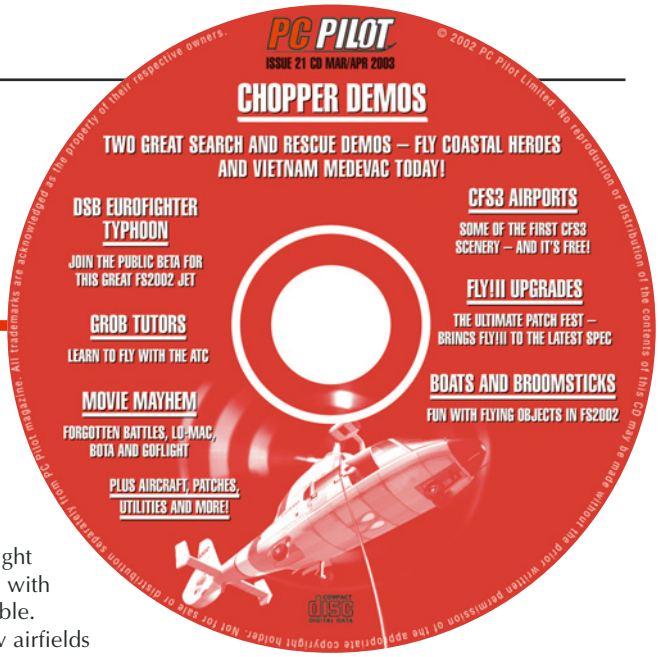
PC PILOT
ISSUE 21 CD MAR/APR 2003
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GETTING STARTED

To get the CD running, close all programs and applications and place the PC Pilot CD in your CD-ROM drive. If Autorun is enabled, the program will start and you will see the opening screen and menu buttons. If you don't have Autorun activated, or the CD doesn't start automatically, press the Start button on your Windows taskbar, move up to Run and left click on it. Type in the Open window: D:/issue_21 (where D is the drive letter of your CD-ROM drive), then press OK and the menu should appear. If all else fails, go to My Computer, right click on the CD icon and select Explore. You should then be able to open up the folders as required. If the menu buttons won't run, then this may be because they are set up to recognise a D drive. If your CD drive is E, F or G then use the Explore method as outlined above.

GOING COASTAL!

There's a real collection of collectives on our latest cover CD, with full demos of the new helicopter sims from the team that brought you the previous instalments of Search and Rescue. Coastal Heroes provides the usual mix of exciting challenges to get members of the public out of trouble, this time using three authentic coastguard helicopters. In Vietnam Medevac, pilots take to the sultry skies of Vietnam in the famous UH-1 'Huey' helicopter, the multi-purpose workhorse of the Vietnam conflict, and get our boys back home. Coastal Heroes and Vietnam Medevac were developed by InterActive Vision, and both demos include two missions and a free flight mode, with all environmental options available, including weather conditions. To find out more visit the publisher's site at www.globalstarsoftware.com.

AN AWESOME FOURSOME FOR CFS3

The developers over at Just Flight have been feverishly tinkering with CFS3 to find out what is possible. They've already got some new airfields working and scenery expert Martin Wright explained that there are three possible ways of adding airfields to CFS3. The simplest is to use one of the standard layouts, as with Interlaken, which you'll find on this CD. Alternatively, you can create a custom airfield using standard buildings. Manston, which is also included here, is an example. Finally, you can build an airfield from scratch using custom buildings, but it'll be a while before one of these is on show to the public. In the meantime, enjoy the four airfields on the CD (they've also included West Freugh, UK and Corte, Corsica) with Just Flight's compliments and keep an eye on www.justflight.com for more news. To install, simply copy the JFCFS301.exe file to your desktop or a temporary location. Once it's downloaded, run it by double-clicking on it. Follow the onscreen instructions to install the airfields.

TESTING... TESTING...

If you've ever fancied a flight in Europe's state-of-the-art combat jet, the Eurofighter, then you won't have to wait much longer. David Brice and the team at DSB Design have generously provided a beta version of their new Eurofighter with a request for PC Pilot readers to put it through its paces.

Their Eurofighter Typhoon package is being designed with support from Eurofighter GmbH, and will feature both twin- and single-seat variants in 16 colour schemes covering each partner nation and their respective air forces. In addition, scenery will be designed for BAE Systems, Warton, where the UK variant of the Eurofighter is based. This version of the aircraft is an un-textured version of the DA4; it does not feature the custom panel, sounds or virtual cockpit that will appear in the final product, but you can see a glimpse of the final version in our screenshot.

If you have any feedback, please e-mail Dave at davidbrice@bigpond.com or alternatively, you can reach DSB through their design forums located at www.dsbdesign.cjb.net.

The beta version of DSB's Typhoon

What the finished version will look like

GROB TUTORS

In our last issue we published a plea from a budding flyer in the ATC for a Grob Tutor that would work in FS2002. Many of you responded and recommended Dave Garwood's Grob 115 in University of London Air Squadron Colours and a Grob Tutor T1 by David Brice of UK Defence Forces Virtual. Check out the author's websites for more of their work, at http://mysite.freeserve.com/3d_hole and www.ukdfv.org respectively. Grateful thanks to both Daves for their kind permission to include their aircraft here.

The T.1 by Dave Brice

Dave Garwood's Grob

FLIGHTS ON FILM

Forget Harry Potter and The Two Towers – there's a whole multiplex full of flight sim films around at the moment and we've put together a selection for you to enjoy. You'll find the latest on BOTA (Battle of The Airlines) and a video of GoFlight's new hardware. Matt Wagner of Lock On explains the principal features of the long-awaited jet sim, and Oleg Maddox runs through Forgotten Battles at the Birmingham Flight Sim Show. Keep an eye out for Oleg's ugly minder who sits beside him throughout the video!

JUST FOR FUN!

Shigeru Tanaka is well known for his aircraft designs for Flight Simulator, but he's recently been branching out and having some fun making rather unusual objects fly in FS2002. As a tribute to the popular books and films about a young wizard (we think you know the one…), Shigeru has developed a flyable broomstick for FS2002. The Nimbus 2003 has a number of animated moving parts, including the wizard's head, and the flight model is very close to real broomsticks our wives have flown. If that's not large enough for you, then try the Cutty Sark, which Shigeru has made to fly in FS2002. Although they're not serious machines, the detail is excellent and shows off Shigeru's skills to great effect. Check out his real aircraft at www.flightsimnetwork.com/shigeru

UTILITIES & PATCHES

Fly!II

Now that the final patch for Fly!II has been released we thought we'd collect together all the patches for Terminal Reality's sim. There's a whopping 100Mb of files, and we've included Updates 1, 2, 3a and 4, plus the global update, 1.52-2.10 and 2.10-2.50. When you unzip the file make sure you read the Readme and version text files BEFORE attempting to install anything. For further information on the patches go to www.iflytri.com.

Airport 2002 Volume 1

Wilco's new Airport 2002 program has suffered problems with Windows 98 so, if you're one of those affected, this patch ought to cure this problem.

X-Plane

Version 6.51 of Austin Meyer's amazing sim has now arrived. As with all X-Plane upgrades this will run as a five-minute demo that lets you take a quick spin.

Twin Otter

Lago's popular Twin Otter has been updated, so here's the patch that resolves a few issues with this aircraft.

Peter Dowson

Once again we're grateful to Peter Dowson for letting us include his free utilities on CD. You'll find FStarRC 1.81, FSUIPC 2.95 plus SDK, WideFS 5.30, PFCDLL 1.48 and, in response to popular demand, an updated but unsupported version of ESound.

VIRTUAL AIRLINES

We've put our latest list of VAs on the CD, and also included a small description of each one to help distinguish between all these great online airlines.

CHARTS

The official versions of the Jeppesen charts used in our tutorial are included on the CD in PDF format. There's also a handy Word document that lists all our prior tutorials. If you have any trouble accessing the charts go to My Computer, right click on the CD icon, select Explore and open the Tutorial folder. To view them you'll need Acrobat Reader, which is also included on the CD. For this tutorial the charts of Hamburg Lubeck and Malmo are quite different to those in SimCharts, so we've included .bmp files of the ones we used in the SimCharts folder.

WinZip & Acrobat Reader

You'll need these important utilities to open up Zip files or read PDF files. Please note that any shareware should be paid for and registered if you want to use it on a regular basis.

IMPORTANT - TECHNICAL SUPPORT

The CD and software on it are free and, as such, neither PC Pilot, nor any of the publishers or developers of the software supplied on the CD, can provide technical support. The software is supplied very much 'as is' and without support. Remember, many of the programs are freeware and are provided by enthusiasts for the enjoyment of others. By all means give us feedback to mail@pcpilot.net but remember that freeware doesn't always work as seamlessly as commercial software. Enjoy the CD and the software on it!

FS Traffic 2002

Scheduled simulation

Your airliners might look beautiful and fly like the real thing; their cockpits might replicate every working switch and instrument; they might even sound so authentic that a pilot would have a job distinguishing them from the turbine hum he listens to every day, but empty skies and deserted airports hardly contribute to a realistic FS experience. You want to see that Virgin Jumbo just when you expect it and airport activity which mirrors the frantic arrival and departure schedules at the world's overstretched airports.

It's hardly surprising, then, that there's been a recent upsurge in programs designed to add more AI traffic into flight simulation, and now Just Flight are set to release their contribution to this burgeoning add-on sector. FS Traffic 2002 doesn't come from the same team who developed the popular FS2000 product for Lago, but the name says it all and Lago have allowed Just Flight to use it. Signs are that this new software should impress as many of us as the original FS Traffic did not so long ago.

The default FS2002 AI aircraft will be replaced by 21 new gmax-designed planes – all boasting animated flight surfaces, transparent cockpit windows and illuminated tail logos – which will range from Dash 8s and Embraer RJ135/145s to a selection of Airbus models and Boeing 737s through to 777s. There's even a Concorde to remind you of what's missing in FS2002 and to get you wondering when PSS will be bringing out their supersonic world-beater. The aircraft will bear the liveries of 42 of the better known airlines from around the globe, giving us about 160 individual aircraft to liven up our airports.

Luton – the busier the better!

The activity in FS Traffic 2002 will be based around departures from 52 airports, with the UK and the US not surprisingly getting the lion's share – six in the UK and seventeen in the US. You can probably make a pretty accurate guess as to which ones these are.

More virtual variety!

The departures affect traffic and airports around the world, so even those airports not featured in FS Traffic 2002 will get the benefits of the program; around 750 airports are expected to see an increase in traffic, thanks to something in the region of 40,000 extra flights being created.

Real-world schedules mean the right airlines at the right airports

Modified taxiways and parking spaces will be created to prevent virtual carnage and keep the traffic moving, and the FS2002 ATC engine will be updated to include contact with the new airlines.

Many people will have already upgraded some of the default airports included in the package, but we're told that the program will be capable of installing the correct parking and runway operations for various third-party sceneries. There's no word yet, though, on which these will be. An included utility should let you create your own flight plans using the aircraft in the package, and you'll also be able to import entire airline timetables, provided that they are available in the designated format.

There's plenty to look forward to, by the sound of things, but it's likely that you'll need a reasonably powerful machine to keep all this extra activity running smoothly. The recommended specifications are still under wraps, but obsessive frame rate counters will no doubt be keeping a close eye on their system's performance. We'll take a proper look at FS Traffic 2002 as soon as we can lay our hands on a copy, along with some of the freeware alternatives and existing AI-improvement programs. ■

Richard Parnell

Plenty more to see... and hear

Preview Information

Publisher: Just Flight
Price: £24.99
Website: www.justflight.com
Developer: Just Flight
Release date: March 2002 (TBC)

Farnborough F1

Aviation Innovation

While we are busy filling the virtual skies with more aircraft, thanks to increasingly powerful AI programs, airport capacity and the volume of traffic currently filling the actual skies is becoming an increasingly crucial problem for both passengers and aviation professionals. The Farnborough FI team are all too aware of this, and are committed to providing a revolutionary reinvention of business air travel for the 21st century. Their plans for the world's first true air taxi certainly make a lot of sense.

A few facts concerning the state of current air travel are particularly relevant here: 38 European airports are likely to run out of capacity by 2010; air travel is growing at a rate of 5-7% every year; the actual average speed of airline travel is only around 300 knots (about half the top cruising speed of a typical jet airliner), and airport congestion is slowing the process of air travel to the point where it now takes the same amount of time to fly to Paris as it did in 1947. The limited amount of airspace available to airliners is also a problem, with 90% of air travel routed through 10% of the airspace. If you also consider delays, the systematic overloading of airports and the travelling time required to reach them, the future looks very bleak for those who need to fly in a hurry. Business travellers make up around 40% of all airline passengers, and if time really is money then an awful lot of it is being wasted.

Looks great – and will perform like a Mustang!

The Farnborough F1 solution is a completely new design of aircraft, to be used as air taxis operating from 'local' airfields. There are currently almost 8,000 ex-WWII airfields in public use in the US, Canada and Europe, which are typically within 30 miles of densely populated areas. Seventeen such airports exist within a 30-mile radius of central London. They are not widely used in commercial aviation because over two thirds of them have runways under 4,000 feet long (and 81% under 5,000 feet) meaning that take-offs and landings are just not possible for the majority of existing jets. Even turbofan business jets generally require runways of 5,000 feet.

Take into account changes in regulations governing pilot and engine requirements for commercial IFR flights, and the stage is set for a new turboprop aircraft specifically designed for small airfield operations. Fares are expected to be no more than the standard business fare from a traditional airline. The range of the F1 is 1,000 miles (London to Rome, roughly speaking), and the Internet-based Global Operating System completes the concept; simply log on, enter your travel plans, select from one of the quotes provided, and make the booking – as simple as that!

The F1 specs are fascinating (X-Plane was used in the development), and it's expected that European and US certification will be achieved by the end of 2006. Remember, in spite of the sad decline of our aviation heritage, that British engineers created the jet engine, the first turboprop airliner and turbofan engine, the first VTOL fighter and the first Mach 2 fighter and airliner. Here's hoping that sufficient investment in the project will turn the Farnborough F1 air taxi into another first. For a more detailed glimpse into the future, take a look at www.farnborough-aircraft.com. ■

Joe M. Besser

A revolutionary aircraft for a revolutionary concept

Construction: Carbon fibre composite

Engine: Pratt & Whitney PT6A-60A turboprop, providing high take-off thrust and steep rate of climb (3,000 fpm climbout)

Length: 35.1 feet

Wingspan: 40.7 feet

Altitude ceiling: FL300

Range: 1,000 miles

Cruising speed: 325 knots (385 mph) at 30,000 feet

Capacity: One or two crew, plus up to five passengers

Noise: Less than 70 dBA at a 1,000-foot flyover

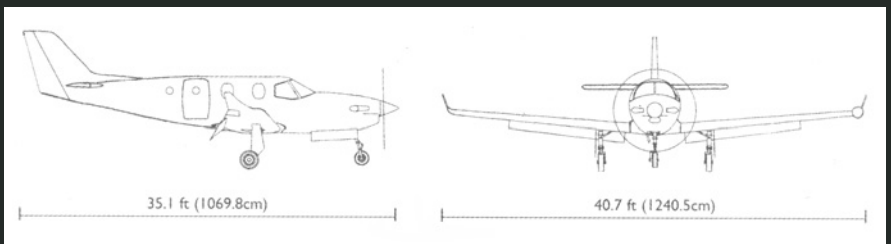
Propeller speed: 1,700 rpm

Service life: 40 years

Airfield ability: Able to operate from a 1,400-foot grass strip

Price: $2.0 million

farnborough-aircraft.com



Forgotten Battles

The Russian evolution

When IL-2 Sturmovik was released at Christmas 2001, a year after Combat Flight Simulator 2, the market was more than ready for a new contender. Even then IL-2's developer, 1:C Maddox Games, was already planning an expansion for IL-2 called Forgotten Battles. Early signs were that this would be a simple mission expansion with some extra planes.

The visit of 1:C's Oleg Maddox to the Birmingham FS show (see the video on the cover CD) coincided with the announcement from Ubi Soft that it would be a standalone product. This was potentially a real master stroke; if it offered anything in addition to a fully patched version of IL-2, existing fans would undoubtedly buy it, but as a self-contained sim it would also appeal to newcomers. The price was eventually fixed at £29.99, and thus Forgotten Battles would be competing head to head with its obvious rival, Microsoft's recently released CFS3. There has been a lot of discontented rumbling about CFS3, mainly concerning its demands on frame rates and its differences to previous versions. "Too game-y," is a common criticism. Could Forgotten Battles trump the CFS series, or would offering more of the same on the Eastern Front be playing it too safe? Does it really offer anything new, or have we seen it all before?

The roundels are wrong, but it's Battle of Britain action

The first thing you'll notice about Forgotten Battles is that the program files are about twice the size as IL-2, and the reason for all those extra bytes soon becomes apparent once you start flying. Little has changed where the interfaces are concerned; the familiar metallic panel greets you, and a bewildering array of graphics and sound settings are there waiting to be adjusted. When everything is loaded (which isn't fast) you're confronted with the main menu, where rookies might find some of the terminology confusing, so reading the manual is essential. While Single Missions, Multiplay and Mission Builder are obvious enough, Pilot Career might not instantly suggest a campaign mode.

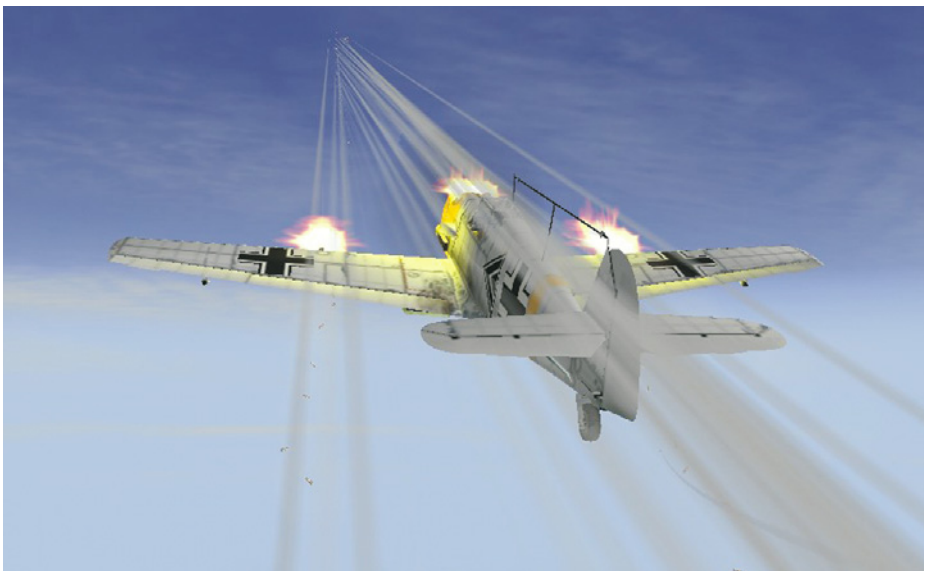
Before diving into any of the options it's also wise to take a look at the Controls page. Scrolling through the huge array of variables will give you an idea of the realism to come – what's Increase Bombsight Velocity? Help!

With such a large number of parameters, an option to print out the list once you've customised your own keys and buttons would be useful, especially when you're taking advantage of the new features that allow you to control multi-engine aircraft realistically.

The familiar IL-2 front end

The basic options for fight and flight are Single Missions, Pilot Career, Multiplayer, Quick Mission Builder and Full Mission Builder. These are all identical to IL-2, as is the Training button. This looks useful, but it's simply an in-game film of a pilot being put through his paces in a Russian TB-3 bomber or a Heinkel He 111. It's of limited interest… until, of course, you start flying the TB-3!

It seems a shame to shoot down those gorgeous DB-3 bombers



You're wasting ammo at that range – even if the trajectories are correct

Selecting Single Mission lets you fly a varied array of ops that are country-specific. You begin by choosing your nationality, and this is where the big difference between Forgotten Battles and IL-2 kicks in. The countries awaiting your allegiance are USSR, Germany, Hungary, Finland and the USA. Yes, believe it or not, Uncle Sam gets a chance out east, but historical accuracy means he can only fly a P-47 Thunderbolt from Italy to attack a Hungarian airfield. Once you've picked a side, you can choose Mission Type, which actually means selecting from the available aircraft. This in turn provides a selection of sorties for that type of plane.

There are 20 all-new single missions spread over the various countries, and a quick look confirms that the quantity of available aircraft has increased from the number in the original simulator; there are now 81 flyable aircraft! IL-2 originally came with 31, while a fully patched version (v1.20) included 50. There's plenty of variety among the 31 extra steeds, and as well as Me 109s, Fw 190s and IL-2s, you can also strap yourself into Me 262s, Hurricanes, Brewster 239s, P-47s, the mysterious Russian B-1 jet interceptor and lots more besides.

We soon realised that with the inclusion of Hurricanes, AI Blenheim Is and early Me 109s, we had the makings of a great Battle of Britain simulator, and one of the stored movie (track) files shows some dogfight action from a Battle of Britain-style setting, albeit over the Steppes rather than the Channel. With such a flexible simulation engine almost any propeller-driven action could be re-created here, but Forgotten Battle's roots are very much planted in the Eastern Front and this is where most of the action takes place.

Once you've exhausted the challenging single missions, the Quick Mission builder should appeal to most users, and setting it up requires very little complicated programming. It's virtually identical to the same facility in IL-2, except that the number of possible permutations is huge. Choice is initially limited to either Germany or Russia, but once you've selected your preferred aircraft you can customise it for different nationalities, including France, Poland, Britain and the USA under the USSR umbrella, and Finland, Italy, Romania, Hungary and Slovakia for Germany. There's also a 'no markings' option that allows users to add their own skins. The customisation doesn't stop at simple liveries – you can change the regiment or pilot, and alter settings such as the machine gun and cannon convergence, bomb or rocket delay, and fuel quantity.

Select the rest of your squadron, up to a maximum of 12 aircraft as 'friendly', and likewise alter their nationalities and details. You can set their fuel quantity, but you can't tinker with their bullet convergence. This is probably just as well, as there are enough other details to consider. The combinations become mind-boggling when you select your enemies (up to a maximum of 16). You could elect to fly a TB-3 bomber and be escorted to your target by 12 French Me 262s, who will attempt to defend you against four Italian Hurricanes and 12 Romanian Morane M.S. 406s!

Some you fly, some you don't

As well as over 80 flyable aircraft in Forgotten Battles, there's also a huge air armada flying around that's strictly in the "you can look, but you can't touch" category, which brings the total number of aircraft to 129. As well as variants of the flyable aircraft, there are also some fascinating machines such as the Blenheim I and IV (the Finns flew these), Messerschmitt Me 321 Gigant (it looks like a flying railway carriage) and the Junkers Ju 52. Looking through the selection of AI aircraft might make you start wishing that you could fly them, but you'll have to learn not to be greedy and just enjoy watching them join in the action.

Uh-oh, we're in trouble… that's an oil leak

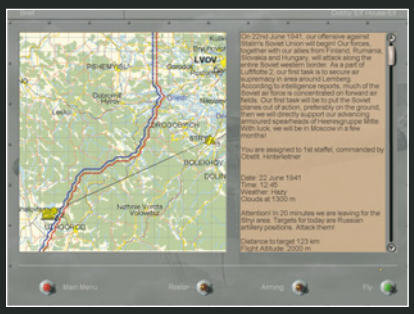
Good night sweetheart!

The bigger they come, the harder they fall!

Putting Forgotten Battles on the map

The vast size of Russia is really brought home to you on seeing the huge area that's been included in Forgotten Battles. When you see a reference to 'map' in the manuals, it either means a map, as in a document for use in campaign planning and briefing, or it can also mean scenery. As well as all the scenery from IL-2 Sturmovik, there are five new 'maps' (i.e. more scenery) covering the Gulf of Finland and Hungary (summer and winter for each) and Lvov (summer). The latter is significant as this covers the area where the war on the Eastern Front began, and lets you join the campaign right at the start of Operation Barbarossa.

The Gulf of Finland area covers Helsinki, Talinn, Leningrad, islands in the Gulf and the huge Lake Ladoga. The scenery is highly authentic, and the use of 1940s maps and plans means that the cities of Helsinki and Leningrad include many period buildings and objects. The Hungarian section covers Lake Balaton and part of Slovenia. Online pilots get even more scenery, including mountain areas with high-altitude airfields.

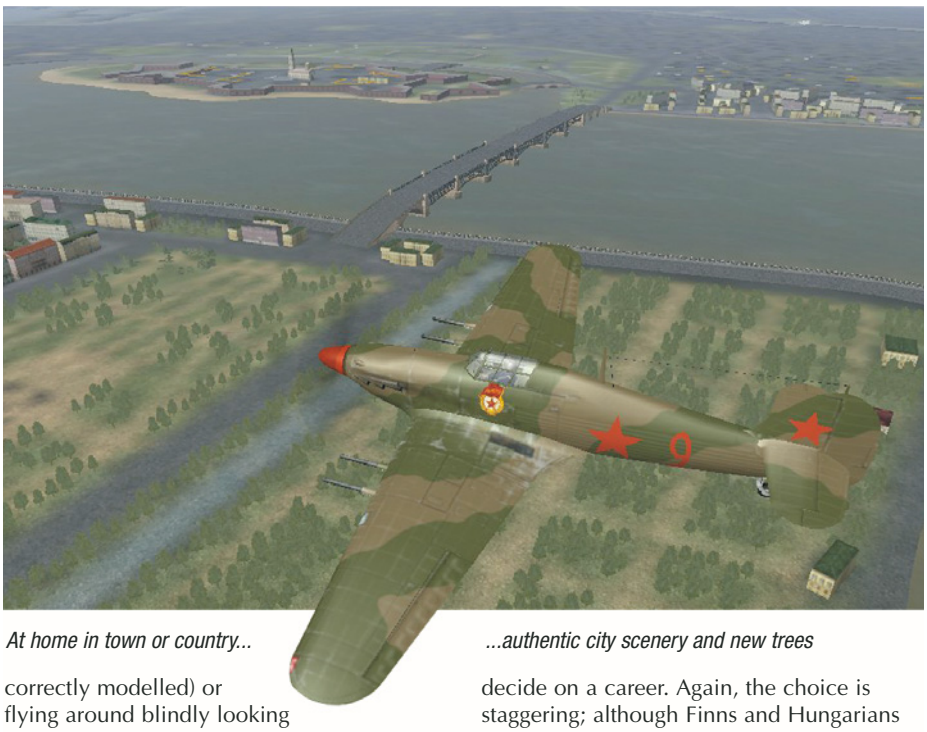


If it's on the map it's in the simulator!

You can obviously set more historically accurate scenarios, but it gives you an idea of the flexibility on offer. The available combinations are almost limitless, and boredom just isn't a factor that's likely to trouble you.

Setting the Difficulty level gives you the chance to toggle the combinations of another 24 switches (up from 18 in IL-2), which will vary everything from head shake to target icons. An easier option is to select from Easy, Normal or Difficult. Switch everything to the most difficult settings and the rookie will find himself either struggling to get off the ground as his plane slews wildly from side to side (torque effect is correctly modelled) or flying around blindly looking for the incredibly elusive enemy. If in doubt, start on Easy and work up!

I'm an airman - get me out of here!



At home in town or country...

...authentic city scenery and new trees

Much of the flight modelling has been re-worked, with improvements to the flight dynamics, and updates to the engine management systems. Woe betide the realism junkie who sets his fuel mixture incorrectly. The landing gear works with uncanny accuracy – watching each leg of your aircraft's undercarriage being punished independently by a bumpy runway is enthralling (well, we thought so). This obsession with detail also runs to the damage modelling. Even the physics of the bullet trajectories are correctly modelled – "unlike some simulators", to quote the developers!

Blenheims make it to the Eastern Front

Weather modelling is jaw-dropping

It's when you move on to the Campaign mode that you see where Forgotten Battles has really progressed from IL-2 Sturmovik – the campaign engine is absolutely huge. Using the Pilot Roster you can create a new identity, select country (USSR, Finland, Hungary or Germany) and rank and then decide on a career. Again, the choice is staggering; although Finns and Hungarians are limited to careers as fighter pilots, the Russians and Germans get a wealth of choice – bombers, fighters, Jabos and more. Altogether there are 13 careers to follow, and you can decide when in the war to begin.

Our chosen hero began his career on 22nd June 1941, the day that Germany invaded Russia, and is making reasonable progress all the way through to 1945. Because it's a dynamic campaign, though, flying the whole thing again as a different pilot means that it won't follow the same pattern. Each time you complete a mission, the results are processed and another mission will be automatically generated – right up until the end of the war. Results of one mission are carried on to the next, and no two missions are the same.

During the campaigns opposing forces automatically advance or retreat, based on the actual history of the battles, but the speed of front line movements can be affected to a limited degree by your success

The shifting tides of war

You might be surprised to see Finland playing such a large part in Forgotten Battles, but it's perhaps one of the oddest facts of WWII that Finland fought three wars from 1939-1945 and, although they counted the Germans as allies, they ended the war on the same side as Great Britain and the US.

In November 1939 Russia invaded Finland and began the so-called 'Winter War'. Stalin took little account of the harsh Finnish climate and assumed Finland would roll over quickly. A bitter war ensued and Finland was supported with military aid by Britain and France. In March 1940 the two sides made peace, and although Finland lost territory they had given the Russians a run for their money.

During the German invasion of Russia, Finland allowed the Germans to use their territory (they had little choice) and as a consequence the Russians bombed them. Finland declared war on Russia in June 1941 and so began the Continuation War. A bizarre situation developed where Finnish Air Force planes, supplied by Britain and the US, fought alongside the Germans; US-built B-239s, for example, were up against British Hurricanes supplied to Russia.

By 1944 it was obvious that the Germans were unlikely to win the war, and in June the Russians launched a huge offensive against Finland. Fierce fighting raged, and although the Finns were able to contain the Russian attack, victory was unlikely. An armistice was signed on 19 September 1944 and, following pressure from the Allies, Finland declared war on Germany on 27 September 1944. This period was known as the Lapland War and lasted until 27 April 1945. During the whole period of WWII, Finland was never occupied – the only German ally not to suffer this fate.

For every Finish B-239 lost, 26 enemy aircraft were downed

AI squadrons have raised their game

(or lack of it). Additionally, objects destroyed in one mission won't be resurrected in the next; every aircraft destroyed, whether friendly or hostile, reduces the number of planes of this type in the theatre. Pilot statistics are comprehensive (you can even replace the default photos), and your career is unlikely to be predictable; you can be killed, captured, promoted, honoured with medals or transferred.

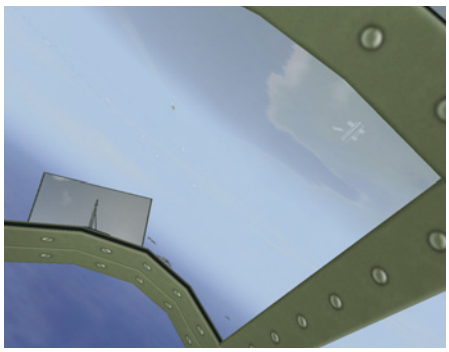
If all that complexity isn't enough, then you need the Full Mission Builder. Drop-down menus let you create your own campaign, and while explaining the complexities fully would require a complete tutorial, the manual isn't hard to follow. Once you've got a basic understanding of how the missions work, you shouldn't have trouble building something yourself.

The multiplayer option hasn't been neglected, either, and whilst signing up is much the same as in IL-2, new missions and an increase in co-op mode to 32 players (from IL-2's 16) is sure to make Forgotten Battles the online pilot's choice.

Finally, a word about the smoothness. Much depends on how much RAM you've got available, and Oleg told us that 768Mb was his ideal! For lesser mortals, it will run smoothly on a 1.2GHz machine with 128Mb RAM, but keep the detail down and don't do too much sightseeing outside the cockpit. If you're equipped with a 1.8GHz machine or better, and a decent graphics card with the latest drivers, you'll find the richness of detail in Forgotten Battles very rewarding. It's certainly more taxing on a system than IL-2, but we experienced none of the problems that CFS3 threw at us. Even if you ignore the combat in Forgotten Battles you'll still be amazed by the flying experience, the new trees, exquisite clouds and even objects such as barrage balloons.

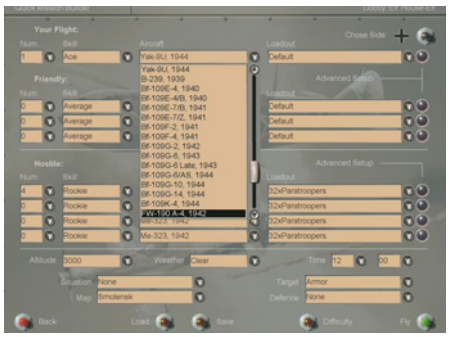
Compared with the original IL-2 Sturmovik, Forgotten Battles does much that is the same, but there's just a very great deal more of it. If you already own IL-2, then consider this as an expansion with an enormous choice of missions and an upgrade in terms of new and improved aircraft, ships, scenery, physics and graphics. Is it worth £29.99? It certainly is, and IL-2's many fans won't be disappointed. It doesn't break any radically new ground – evolution rather than revolution – although the bombing option will certainly appeal to many, despite the inability to crew bombers online. If you haven't yet sampled IL-2 Sturmovik, but you like the idea of WWII prop combat, then look no further. The best has just got better – this is a five star release! ■

Derek Smalls



Mirror, signal, manoeuvre

The Me 262 – deadly in the right hands



Choose your weapons

Review Score

Publisher: Ubi Soft

Price: £29.99

Website: www.il2sturmovik.com

Developer: 1:C Maddox Games

At a glance: Expensive update or full-blown sequel to the mighty IL-2? It's not easy to decide, but fantastic detail, a huge variety of missions and exciting flying make this a must-have for combat newcomers and veterans alike.

System Requirements: PIII 800MHz, 256Mb RAM, 16Mb 3D graphics card, 900Mb hard drive space

Recommended: P4 or Athlon 1.7GHz, 512Mb RAM, 32Mb 3D graphics card

De Havilland Dash 8

Cutting a dash

Phoenix Simulation Software is maintaining an enviable reputation in the FS2002 add-on market, with their A320 Airbus receiving rave reviews recently from both PC Pilot and an actual Airbus pilot. Their latest aircraft, the Dash 8, is a buy-online gem that follows the high standards already set by its stable-mates.

The package contains two variants – the 300 and the newer, slicker Q300 ('The Quiet One'). Both fly identically, but have subtle differences in instrumentation. The Q300, for example, is equipped with more electronics, including a spiffy MFD coupled to the comprehensive EFIS system for complete in-flight navigation displays. Both aircraft are absolutely stunning, in their flight model and in the level of detail inside and outside the cockpit.

PSS's Dash 8s include every single switch, dial and lever found in the real aircraft, and they all work. Of course, not all of them affect the flight model, but the presence of each switch and button does make the experience wonderfully immersive as you work through the actual Dash 8 checklists included with the comprehensive manuals.

Phoenix just love their lighting effects… and so will you

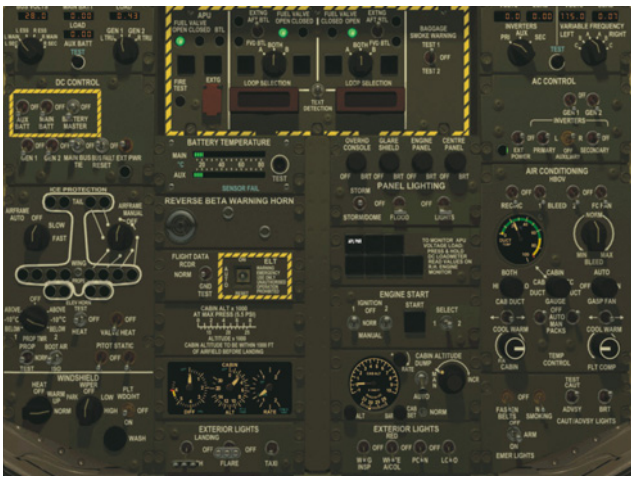
Sleek and elegant – the Dash 8-Q300 in flight

Everything that you would expect to see in a high-quality add-on is modelled; in the cockpit you'll find a working weather radar, TCAS, custom autopilot, programmable FMC and, of course, all the usual graphical goodies such as moving controls and wonderful night lighting. Outside you'll see fully animated landing gear, cargo and passenger doors, air stairs and even two-speed windscreen wipers. The developers have even gone as far as modelling the Dash 8's two-stage roll spoilers and rudder.

Phoenix has done a great job at keeping the vast array of information in the cockpit accessible. Clicking on the left half of the cockpit dials zooms into them, giving easy access to primary instruments and autopilot controls. Clicking on the right half of the cockpit zooms them in for close-up working with the engine dials – essential for measuring propeller RPM on approach; maintaining correct prop RPM on approach and keeping the aircraft's speed down is a challenge, to say the least.

This 'click to magnify' approach can also be used to bring up the centre console and EFIS unit, which saves memorising [Shift] key combinations while you're flying.

The daunting array of instruments demands a high-resolution display



The illuminated overhead panel

A bigger Dash of detail...

For even more detail, zoom into the engine panels and the main flight dials

Visual delights aren't confined to the cockpit interior

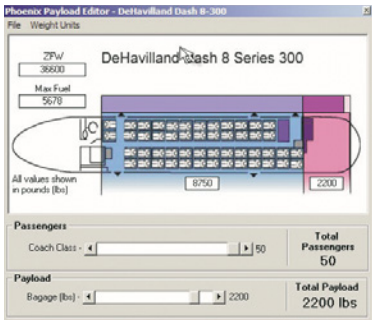
The package includes a complete navigation database, including SIDs and STARs, which can be worked entirely from your PC keyboard; this makes entering long flight plans a dream. In addition, the unit can load FS2002 flight plans from within the plane, for those that just want to jump in and fly a route.

Visual wonders aside, it's during flight that the aircraft really grow on you; they are just so wonderfully 'right' to fly, from the low Vr speed to the somewhat frisky nature of the plane in descent and the magnificently low stall speed. Everything about these planes just feels perfect.

Phoenix provides two small applications that allow the configuration of buttons to access the plane's unique features, such as the air stairs and doors. You can also configure passenger load, and choose whether or not the aircraft is ready to go, or 'dark and cold' at the start of a flight. The latter is by far the most fun, since working through the huge overhead panel, configuring switches and systems, is exactly what many of us want.

While the quality of the aircraft is undeniable, and PSS's attention to detail and dedication to realism are evident throughout, a less than positive side to the product is the distribution method and cost. For those not concerned with liveries and finery, the base pack itself can be bought for just £15.00, which is a bargain by anyone's standards. Additional liveries (there are 30 to choose from) are available for around a fiver each, which isn't quite such a bargain, although reasonable offers are available if you buy multiples.

Actually downloading your purchase is a little involved. The first stage is painless enough, and involves downloading a 500Kb installer. Run the installer, though, and you'll have to endure a set of automated downloads in excess of 30Mb. You'll then need to go online to download the manuals separately, and these weigh in at around the 4Mb mark.



The Payload Editor utility gives you complete control over weights

This is a marvellous aircraft, and one which has recently dominated our flying in FS2002, almost even to the exclusion of Phoenix's own formidable A320. It's let down slightly, however, by the cumbersome distribution method. If you have access to a fast Internet connection, then don't hesitate if you're thinking of buying; if you don't, then perhaps it would be wise to wait until Just Flight's promised release of the boxed version. ■

Peter Wright

Review Score

Publisher: Phoenix Simulation Software

Price: £15.00 for the base pack (additional liveries £5.00 each, or less if you buy a selection)

Website: www.phoenix-simulation.co.uk

Developer: Phoenix Simulation Software

At a glance: A fantastic aircraft model and marvellous flight dynamics, let down only by a huge download time.

System Requirements: PIII 800Mhz, 128Mb RAM, 200Mb hard drive space, Windows ME or later (XP recommended)

Recommended: P4 or Athlon 1.2 GHz, 256Mb RAM, 64Mb 3D graphics card

Airport 2002 Volume 1

Too much technology?

The Airport 2000 add-ons from Wilco have always ranked amongst the best, in terms of their overall design quality and accuracy, with their only downside being the lower frame rates generally resulting from the improved visuals. We might as well say straight from the outset that this downside is a significant factor in the case of their latest product, their first for FS2002. Airport 2002 Volume 1 brings to FS2002 a new selection of high-quality airports, a new 737-700, and introduces a much discussed new development in scenery design, FS NAT (Flight Simulator New Animation Technology). The price you'll have to pay, though, in overall system performance, may be too high for many…

We used a reasonably well-specified PC for the review, with an Athlon 1800 XP processor, 512 Mb of RAM, a 40Gb hard drive and an nVidia GeForce2 GTS video card – nothing too spectacular, but probably not dissimilar to the setups many of you have. The weakest link here is probably the video card, but it still provides reasonable 3D performance.

FS NAT is crying out for more comprehensive instructions

Seven airports are included: Paris Charles de Gaulle, London Heathrow, Munich International, Atlanta Hartsfield, Los Angeles International, Chicago O'Hare and Dallas Fort Worth. While we could wax lyrical about the graphical wonders to be found in these airports – where the detail level extends to individual cases on a baggage trolley and where airports are surrounded by miles of properly scaled fencing and a remarkable diversity of architectural styles – the screenshots speak for themselves. As well as an impressive selection of static objects, there are plenty of dynamic events unfolding too; catering and passenger buses come and go, cargo is loaded and unloaded, and jetways move, all with accompanying sounds. FS NAT can be disabled, but then why would you buy the program in the first place?

The usual leg room problems in Economy class

It's obvious when you're on approach to the included airports that the designers at Wilco have spent some time making sure that the perceived detail is quite high. They've added just enough modelling detail to take away that shoe-box look, but have created some truly superb photographic-quality textures that fool your eyes into believing there's more form and depth than really exists. It's very easy to become blasé about the amount of work that goes into a project like this; successful 3D design is a skilful and time-consuming process, which Wilco have clearly mastered.

After a spell on the ground, you'll see that what FS NAT does all by itself is impressive, but this new animation technology is also designed to allow you to create your own quite sophisticated animations for different objects within the FS environment; this includes aircraft, people and a range of ancillary support vehicles, to which you can also apply sound and lighting effects at the same time.

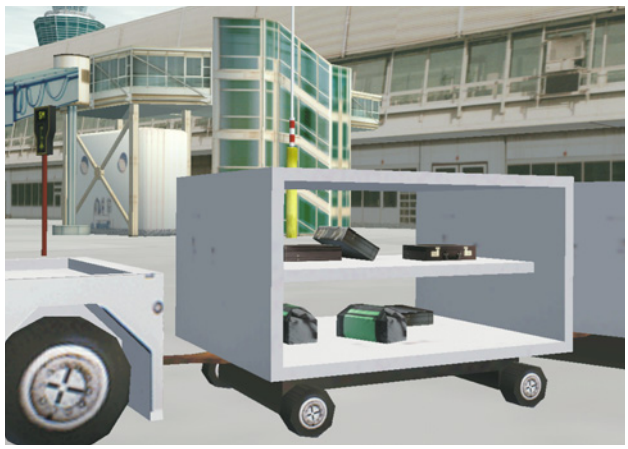
Essentially FS NAT is a script-driven language that uses an interpreter to

FS NAT activity certainly livens things up

transcribe specific written commands to movements. These scripts are in the form of straightforward text that can be edited in any simple text editor such as Notepad, and if you've done any programming in Basic or a similar interpreted language you won't have any trouble using FS NAT.

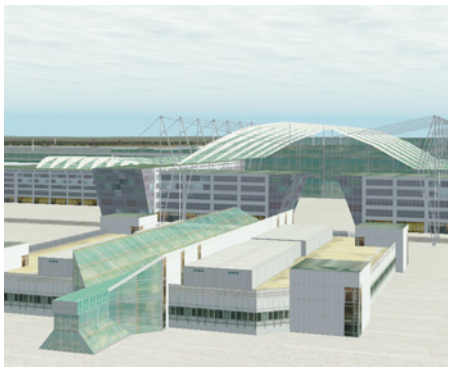
If you haven't (which will be the case for most of us) there are examples and tutorials on Wilco's website, and the Airport 2002 software contains a manual in PDF format, along with a number of active and inactive scripts for you to examine. Without this assistance, the process would be rather more complex, but fortunately the installation includes the FS NAT BGL control panel that allows you to easily define a path for an object. Simply 'slew' around pressing the Capture Point button at each turning point; you'll then find a text file containing the target co-ordinates for each segment of the animation in the root directory of your drive.

If you cut and paste this data into the object's script file, it will retrace the same route. In its simplest form this will continually cycle an object from one place to another following a predefined path, although FS NAT is potentially much more powerful than this. You can start an animation from a keyboard command, have it start in response to a specific trigger (when your aircraft reaches a specific location, for example), or combine a number of animations together in a sequence. You could have a couple of fire trucks waiting at the runway which are called from the cockpit to simulate an emergency, or passengers filing down an air bridge onto your aircraft; it really is up to your own imagination.



You can almost read the luggage tags!

This sounds exciting, and just like the sort of thing you can imagine wanting to tinker with for hours, but in practice the interface is quite cumbersome to use. More concerning is that in many cases the animations (particularly in demo mode) don't actually do what they are supposed to. We e-mailed Wilco with a number of questions regarding FS NAT but have yet to receive any response at the time of going to press. Many users, it would seem, are rather more likely to just enjoy the improved activity that FS NAT provides than to dabble in it themselves. This is a shame, because there's no reason why this should be beyond the abilities of the average FS enthusiast, but more documentation is needed to bring users up to the necessary level of competence.

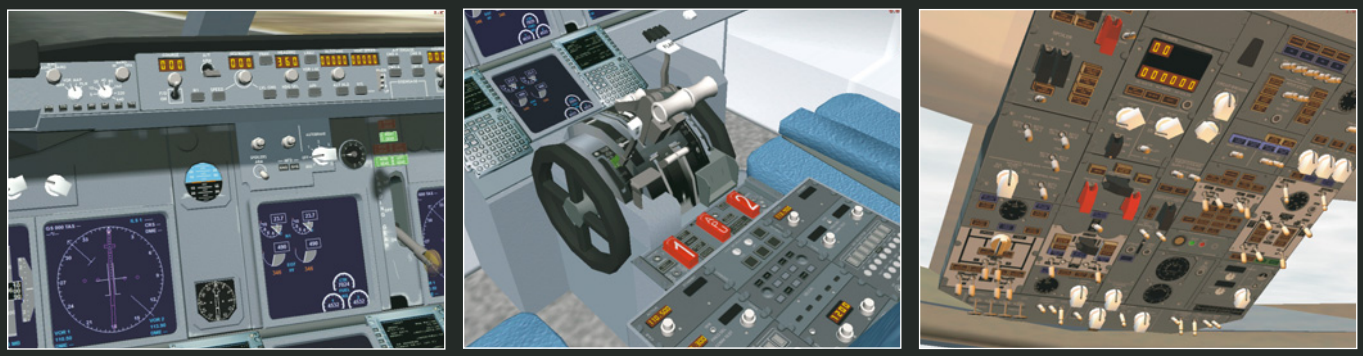


Lovely glass textures at Munich International

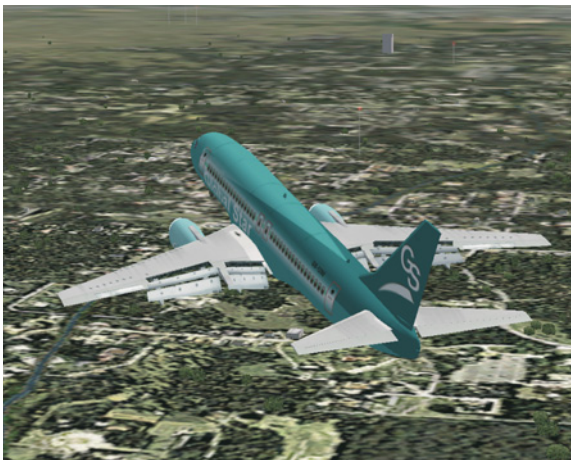
At first glance the Global Star 737-700 looks like many other add-on aircraft… until you step inside the cockpit and see the disturbing proclamation of "No 2D Panel available" and nothing else. So, hanging on for grim death to your seat, which at this point is suspended in mid air, you quickly punch the [S] key to find the other new feature that Wilco have introduced, the rather nifty 3D cockpit. This isn't your normal out-of-focus bitmap that does little more than stare back at you; this one is fully functional. You can set headings and speeds on the autopilot panel, flick through all the

Welcome to LA

3D or not 3D?



The more you get used to it, the more you'll like the fully functional 3D cockpit



No complaints about the aircraft in the package

Find some sun and enjoy the reflective textures

switches, programme the FMC and plenty more.

Wilco have also programmed some special keys to take you straight to specific areas of the flight deck; pressing [Ctrl]-[2] drops you straight into the co-pilot's seat, while [Ctrl]-[7] gives you a wing seat in the economy section. You can also scroll around the cockpit with the mouse and, provided it's got a scroll wheel, zoom in and out as well. Because we've all been used to using 2D cockpit displays for using instruments, Wilco's 3D version takes some getting used to. It's one of those things that you'll either love or hate but – take our word for it – it does grow on you.

The bottom line is that you'll need to have a fairly meaty PC, and be prepared to put up with somewhat lower frame rates than are ideal, before you're likely to be impressed by the Airport 2002 package. The quoted minimum requirements mention a 700MHz processor, but we'd have to say that this is wildly optimistic, and suggest that you need something nearer the 2GHz mark to enjoy it without suffering a great deal of frustration. It appears that Wilco have managed to create a product that's beyond the scope of most user's hardware. If you're lucky enough to have a new super-computer – something like a 2.8GHz P4 with all the corresponding bells and whistles, then Airport 2002 should be awesome.

Quoting actual frame rates can be misleading in a review, because computer systems vary so much that even the speed of the motherboard's front-side bus can make a difference to the performance figures, but on our system the frame rates at most of the airports were unacceptably low. The FS NAT technology undoubtedly has the potential to be a significant step forward, particularly for those that like to simulate the workings of a typical airport to their own satisfaction, but Wilco really need to do some work on the interface, add a lot more documentation, and iron out a few of the bugs before we'd be happy to recommend it.

AVSIM (www.avsim.com) now hosts a Wilco support forum, and anyone considering Airport 2002 Volume 1 would do well to have a look through some of the postings. You might decide that you'd be better off instead with one of the other stunning airliners currently available and a scenery package which provides a little less ground-based activity and detail but is less of a drain on your PC's processing power. ■

Joe Lavery

Southern hospitality at Atlanta

Review Score

Publisher: Just Flight/Wilco

Price: £24.99

Website: www.justflight.com & www.wilcopub.com

Developer: Wilco Publishing

At a glance: Superb airports, but the full effects require more processing power than most people have available.

System Requirements: PIII 700MHz or equivalent, 128Mb RAM, 600Mb hard drive space, 64Mb 3D graphics card

Recommended: P4 or Athlon 2000+, 333MHz bus, 512Mb RAM, 128Mb 3D graphics card

Junkers Ju-52

Going visiting with 'Auntie Ju'

The first prototype of Hugo Junkers' Ju-52 took to the air in 1930, and before long became a popular airliner and cargo workhorse in several countries. Its abilities didn't go unnoticed by the Luftwaffe, and it was extensively used throughout WWII in roles as diverse as bomber, troop carrier, and cargo plane. Function over form seems to have been at the heart of Herr Junkers' design, and the one immediately striking feature of the Ju-52 is its corrugated metal skin – first used by Junkers in their WW1 fighter, the CL 1.

Great visibility and something solid to get your hands on

This virtual version from the Junkers Ju-52 Factory is available in several variants and liveries, ranging from a 1935 Lufthansa paint scheme to a Confederate Air Force repaint of a WWII Luftwaffe aircraft. There's also a civil version with floats for those of you who like to get your feet wet, and a ski-equipped version is expected sometime in the future. The aircraft comes with a semi-photorealistic panel that has been modified to include some modern features such as autopilot and wing leveller, but at least the labels on the panel are in German! There is also a virtual panel available that shows you the large wooden 'steering wheels' that the Ju-52 uses rather than the more usual yoke or stick.

Once you start flying the aircraft, you'll notice how it rolls slowly down the runway and then gently lifts into the air at take-off speed almost of its own accord. Remember that the maximum speed of the real aircraft is only around 170mph, so the feeling of authenticity starts on the runway. The aircraft feels heavy to fly, but appropriately so given that this is a 1930s aircraft and not a fly-by-wire marvel. Although there are still Ju-52s still flying, we haven't had the pleasure of seeing (or hearing) one, but Trevor Morson's credit for the sound files is usually as good a recommendation as any for quality airborne audio.

Once you are up in the air, the aircraft looks stunning, partly thanks to the high-resolution textures used, even though it was created in FS Design Studio and not gmax. Be wary of using the smoke system, though, as the three huge plumes of black smoke almost hide the Ju-52 completely! There are plenty of nice touches on the aircraft – animated doors, stairs, flaps and ailerons, and rolling wheels. Internally you can see the passenger seats or an empty floor, depending on the version you are flying, and all variants include some pleasing night lighting effects, giving a warm glow from the cabins and the radio operator's position.

When versatility really meant versatility

While not an aircraft that conforms to the wider notions of airborne beauty, the Ju-52 certainly deserves its place in history, and it's pleasing to see that it has its devotees – a plane to please both civil and combat pilots? Moreover, it's actually a great plane to choose for a spot of sightseeing, with its low performance and forgiving nature. ■

Chris W. Balmer

Ju-52s were in service for over 50 years

A rainy (and smoky!) day at Innsbruck

Climbing out from Lake Como

Review Score

Publisher: Junkers Ju-52 Factory

Price: Freeware

Website: www.ju52-3m.ch

Developer: Pierino Primavesi

At a glance: A fascinating aircraft modelled by genuine enthusiasts.

System Requirements: None listed

Recommended: PIII 1.2GHz, 128Mb RAM, 32Mb graphics card

Iron Knuckles

DC-9-30

Managing a man's machine

The mid-60s was a time when pilots flew aeroplanes the way many of us think they should be flown – when FMCs and computer-assisted controls were a thing of the future, and airliner navigation was almost a profession in itself. It was this era that saw the introduction of Boeing's only real competitor to its initial 737 line, the McDonnell-Douglas DC-9. Flight One have now developed a FS2002 version of this legendary aircraft, providing an authentic introduction to edge-of-your-seat, bare-bones 'Iron Knuckles' flying.

A new perspective for high-tech fliers

The exterior model screams professionalism, and the faithfully crafted shape is equalled in quality by the features on offer; high-resolution textures, smoothly animated flaps and spoilers, and all the usual refinements are present and correct. What really impressed us, though, were the beautifully recreated reverser buckets you usually see on Boeing 737-200s these days, and the passenger doors which can either open and fold out with stairs at the front of the aircraft, or move down from the rear with an added hand rail. Flight One only include two liveries with the package but, thanks to their popular Text-o-Matic livery implementation program (made famous by Dreamfleet's 737-400), many more designs are available. Thankfully the entire airframe has been designed in such a way that very modest computer resources are required, with a correspondingly low impact on frame rates.

All aboard!

The developers' efforts are also clearly visible inside the aircraft. It quickly becomes apparent that this is no ordinary panel; you'll be pleased to see two fully working overhead panels, a throttle quadrant and a radio panel. The developers are clearly aware of what a serious simmer expects, and have included high-resolution pop-ups of both the primary flight instruments and engine read-outs. You could be forgiven for thinking at first glance that the main panel looks a little odd with its blue background colour, buttons in unusual places, and a rather sparse layout, but that's precisely what you'd find in a real DC-9. The dials and gauges are meticulously detailed, and have a polished look to them which really stands out. The custom sound set too is pleasingly accurate, with both engines emitting their characteristic whine when take-off thrust is applied.

Programming the panel allows you to get stuck into some complex real-world procedures, although this isn't compulsory. If you prefer, you can simply start the engines and take off without any further ado, but if you want to do it correctly you'll have to learn the engine start-up procedure which requires systems such as the APU (Auxiliary Power Unit) to be implemented. The right balance, therefore, between complexity for the advanced simulator pilot and ease of use for the less systems-minded flyer, who might quickly tire of continuous button pressing.

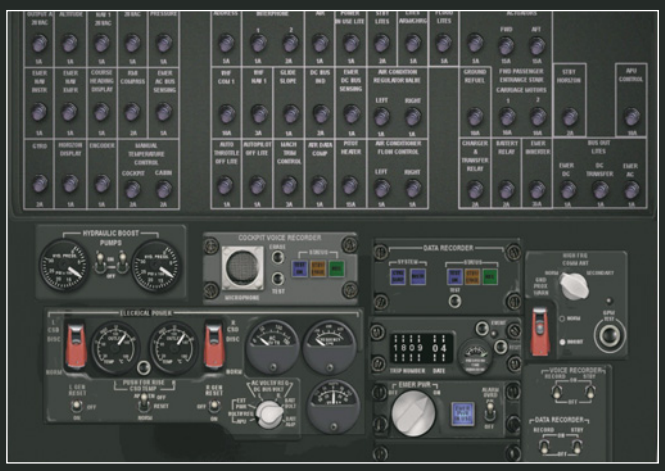
Flying the DC-9 is a welcome change from recent high-tech extravaganzas. This is an aircraft that was designed and built before the first FMC was on the drawing board, and we're finding ourselves more wrapped up in the HSI than we've been for a long time. With no on-board computer or satellite navigation system, everything has a back-to-basics theme to it. Flying by hand is smooth and surprisingly easy, while navigation requires a great deal of conscientious forward planning. Managing everything at once is something of an art form with this aircraft; even with the autopilot engaged you must still navigate with charts and the HSI, course correction, and the constant checking and monitoring of your route. This

Analogue adventures

Not an FMC in sight

The autopilot and throttle quadrant take some getting used to

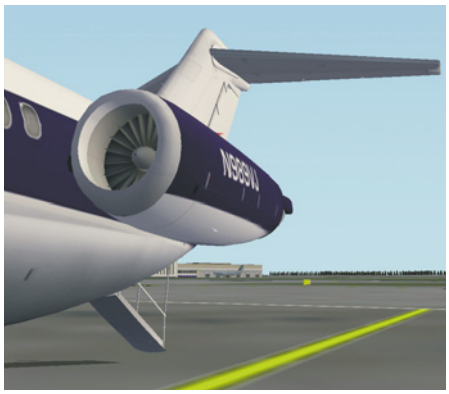
Don't be daunted by the overhead! It can be as functional or as simple as you like



You'll find the manual essential here… even the circuit breakers work!

may seem like too much, but in reality it's truly enjoyable. If you've grown a little weary lately of programming FMCs, MCDUs and leaving everything to the autopilot, the DC-9 with its analogue gauges is a thoroughly pleasant alternative you should consider.

The package does have its drawbacks, though. In the virtual cockpit the engine gauges don't work, and there are a few problems with regards to the autopilot – not capturing altitude properly, for example. Some of the switches on the overhead don't function as they should but, having said that, it's good to see that there is already a second service pack available from Flight

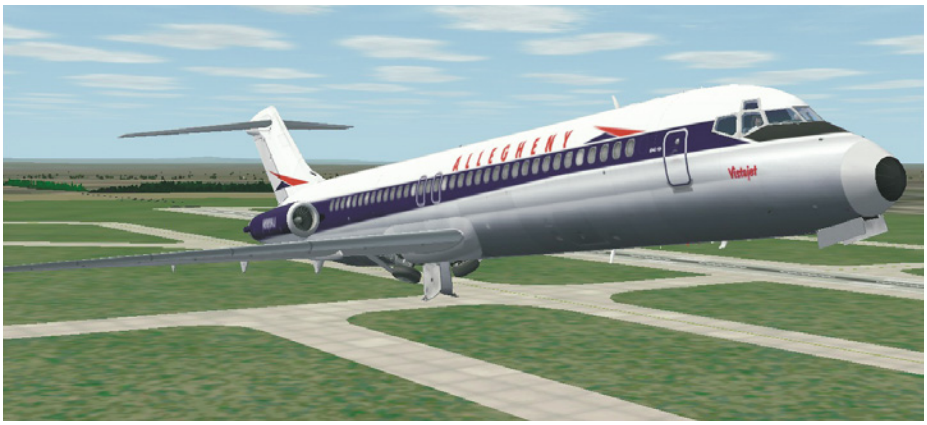


The Pratt & Whitney JT8D-15 - pure 1960s horsepower!

One which corrects most of these problems. The CD version should include any minor corrections required and some additional liveries, as well as adding more functionality to the panel.

The reconstruction of this classic airliner is a great achievement. Not only is it a faithful rendition down to the last procedure, but it demonstrates a significant understanding of both the aircraft and the enthusiasts who will be flying it. The DC-9 certainly made an impression on us, and will undoubtedly do so on many others. Very slightly rough around the edges it might be, but it's still a classic in every respect. ■

Eoin Sutton



First-rate high-resolution textures

Review Score

Publisher: Flight One

Price: $24.95 (£16.00 approx.) download

Website: www.flight1.com

Developer: Flight One

At a glance: A superbly constructed aircraft which is hugely enjoyable to fly. A few minor bugs, and its back-to-basics theme won't appeal to all, but hands-on flying in FS2002 has never felt so good.

System Requirements: If FS2002 works on your system, so should this!

Recommended: P4 or Athlon 1.2GHz, 256Mb RAM, 64Mb 3D graphics card

Ready For Pushback

747-200 Classic

Systematic simulation

It's a rare occasion when someone releases a truly 'realistic' aircraft; often the development costs and time involved are simply too much for many developers, and the market for aircraft featuring complete systems implementation is by no means a large one. Hence this area is often neglected by major developers. A few such aircraft have made it onto the market, though, with some of them – 767 Pilot In Command springs to mind – being particularly successful. VMax Flight Systems' recently released 747-200 Classic looks set to become the latest favourite in this niche area. Many of you will be familiar with the FS2000 747-200 released by AETI – the previous incarnation of Vmax Flight Systems.

As with the DC-9 reviewed elsewhere in this issue, the 747-200 was flying well before the era of glass cockpits and computerised systems; it was built with the classic 'steam' gauges and demands a far greater workload in the cockpit. The Vmax 747-200 strives to be as complex as the real aircraft, and it's obviously the flight deck that's going to be of the most importance to enthusiasts. Eighteen months in the making, the team claim that this is the most sophisticated panel created for use in FS2002.

You'll spend hours admiring the external detail

Once you've got used to the look of the classic gauges, you'll realise just how many of the exact procedures used in the actual aircraft can be performed here with the use of the pop-up panels, which include overhead, electrical, fuel, hydraulic and INS (Inertial Navigation System). An enormous 400 gauges and switches are functional, bearing out the developers' claims of ultra-realism within the limits of Flight Simulator.

Numerous pre-flight preparations are necessary before you can attempt the engine start-up procedure. You'll need to start the APU, get the electricity running, and activate the bleed air, but there's plenty

The virtual cockpit – heavy on detail and heavy on frame rates!

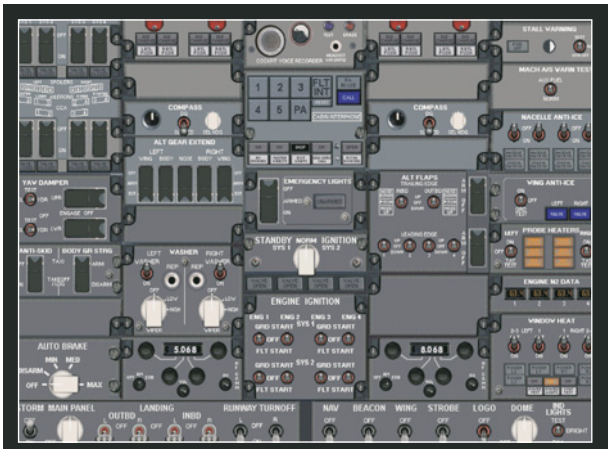
more to do than simply press a few buttons. Thankfully the huge PDF manual is excellent, because you won't get far without it – even the veteran enthusiast will need some time to familiarise himself with the amount of detail involved here and the style of the panel. In a perfect world every add-on would feature a manual this comprehensive (the tutorial is an especially worthwhile feature) and developers of similarly complex aircraft would do well to follow Vmax's lead in this respect.

The INS, predecessor of the FMC, is functional, and is a nearly exact replica of the real thing, allowing only nine waypoints to be entered at a time for the autopilot to follow. The autopilot itself is a far cry from those we see on modern aircraft, and there's no VNAV or LNAV buttons to simplify auto-flight – back to the manual again!

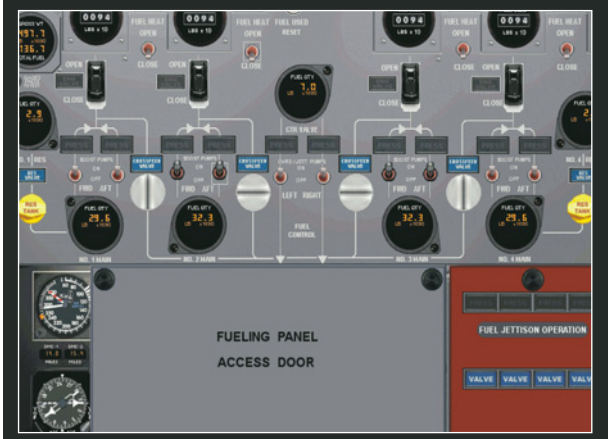
There are some novel additions in the cockpit which have never before been attempted; you can actually lighten your load in flight through the fuel jettison panel, and the fuelling panel lets you refuel your aircraft on the ground. Simply set the amount you want transferred into each tank, and open the valves. This is a neat feature, which is handy if you prefer to avoid menus and keep the experience as realistic as possible.

The functionality of the panel is beyond question, and will delight those for whom this is important, but some enthusiasts might feel that too much emphasis has been placed on functionality and rather less on presentation. The overall quality of the bitmaps is disappointing in such a

Classic good looks from any angle



You'll be grateful for the huge manual



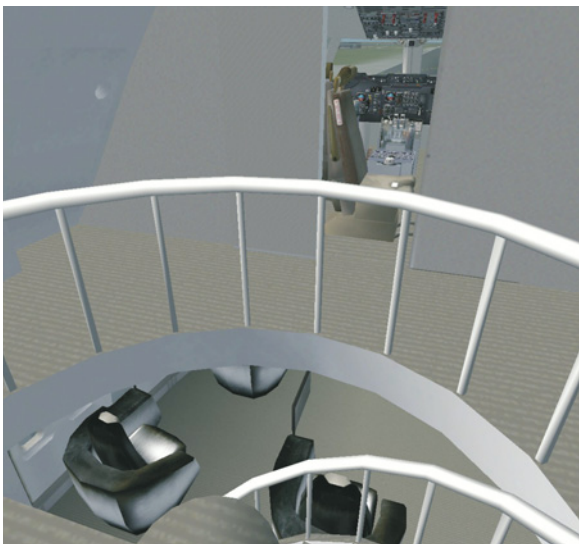
Fuel jettison is just one option on this totally functional panel

More functionality on the hydraulics panel, but the visual quality could be better

The flight information on the main panel will keep you on your toes

Flexing wings are one more indication of the quality on show

See what we mean about detail!



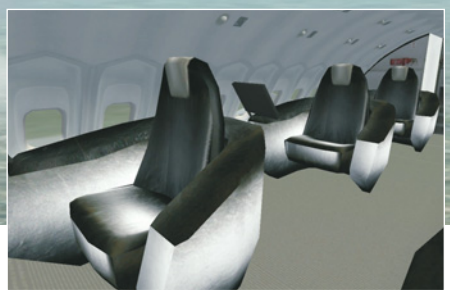
Stroll around the cabin for a truly immersive experience

package, and the hand-drawn switches and gauges might disappoint some virtual flyers.

The flight model is smooth and surprisingly responsive. Once the trim is set correctly, the 747-200 is a joy to fly; the heavy feeling you would expect from such a large airliner is absent and, with several 747-200 captains involved with the design and flight modelling, we'd have to assume that this is accurate.

Three basic liveries come with the download European package (the Vmax in-house livery, Virgin Atlantic and KLM), and some different liveries accompany the North American download; all are high-resolution and visually impressive, although the 50Mb size of the download will make the CD version a better option for most of us. Further packs of four liveries are available for download at $9.95 (£6.00 approx.) per pack.

On the exterior of the aircraft you'll find all those features you can think of that we now expect as standard on state-of-the-art airliner models: flexing wings, reversers, rolling wheels, tilting bogies and working cabin and cargo bay doors. The level of detailing extends into the cabin where, if you have



Sit back and enjoy the luxury

ActiveCamera Pro installed on your system, you can enjoy a walk around the upper deck of the aircraft. First Class looks suitably opulent, and travelling from cockpit to cabin like this adds to the sense of immersion.

The virtual cockpit (just down the aisle from first class!) is nicely detailed and all the gauges work, but the detailing here can hit frame rates to the point where it might frustrate users with lower-spec computers.

Vmax's 747-200, like many of the best things in life, will reward you handsomely if you're prepared to put in the effort required to get the best from it. If realism is your goal in your virtual flights, you'll understand that complex procedures and a degree of difficulty are part and parcel of this, and the satisfaction of mastering the Classic is well worth the effort involved.

Eoin Sutton

Review Score

Publisher: Vmax Flight Systems

Price: CD version $34.95 (£22.00 approx.), download $24.95 (£15.00 approx.)

Website: http://simpilot.com

Developer: Ralph's Panel Shop (http://panelshop.com)

At a glance: A hugely detailed and intricate package, with beautiful exterior modelling and liveries. The complexity won't suit everyone.

System Requirements: 500MHz+, 64Mb RAM

Recommended: PIII 1GHz+, 256Mb RAM, 64Mb graphics card

DHC-6 Twin Otter

A true multi-purpose model

This recent offering from Lago introduces us to the delights of the adaptable STOL (Short Take-Off and Landing) aircraft that's been the short-haul workhorse of choice for many small airlines – the De Havilland DHC-6 Twin Otter turboprop, or Twotter as it's often called.

The DHC-6-300 aircraft is provided in a range of 13 liveries and in four different configurations: conventional wheels, floats, skids and an amphibious variant of the DHC-6-100. The gmax modelling is well executed, with smooth lines and nicely detailed external equipment, which naturally includes animated wheels, flaps and so on. It's also worth mentioning the reflective aircraft textures, which were created using a new layering technique that combines painted surfaces with highly polished metal areas, and which we have to say look excellent.

The cockpit is equally impressive, and falls somewhere between a superb hand-drawn panel and a full photographic representation. The gauges are clear to read, yet have that almost reflective quality that is very difficult to create by hand. The panel comes with a range of expandable mini-panels, making instrument reading as simple as you like and causing no strain on the eyes.

The aircraft is, in fact, designed to be flown in virtual cockpit mode, using special key strokes to access those controls that are normally not available in this mode, together with the mouse scroll wheel for zooming and panning the view. The author suggests that multiple-monitor users could even undock these various ancillary panels to a second monitor, leaving your main monitor free for the external view. For such a basic construction, the Twin Otter has more independent panels than most high-tech jets.

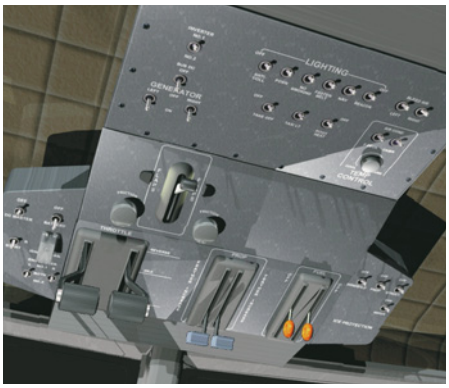
Snow on the runway? No problem

As we've said many times before, however, it's the flight dynamics that make or break an aircraft, regardless of the quality of the modelling, panel or any other features, and the development time and skills apparent in the overall construction of the aircraft are reflected in the flight model. It's a stable platform that is a pleasure to fly, and is definitely a pilot's aeroplane. If you want full IFR conditions, it has all the instrumentation you could want.

Otters are always at home on the water

The package comes with a detailed 31-page manual in PDF format, which includes a test flight from Brussels National to London City so you can get acquainted with all the Twin Otter's functions. This is a well developed product that lives up to Lago's usual high standards, and will be a worthy addition to your fleet, particularly if your flying often takes you to the more remote corners of the virtual world. ■

Joe Lavery



Nothing too exotic here, but thoughtfully detailed nonetheless, and the mini-panels are a nice touch

Review Score

Publisher: Lago

Price: €20.00 (£13.00 approx.)

Website: www.lagoonline.com

Developer: Igor Suprunov/Mathijs Kok

At a glance: Ideal for heading off the beaten track. Whether it's a grass strip on top of a plateau in New Guinea, a nearby lake, or the frozen wastes of Antarctica, the Twotter will get you there.

System Requirements: PIII 750MHz, 128Mb RAM, 35Mb hard drive space

Recommended: P4 or Athlon 1.7GHz, 256Mb RAM, GeForce3 or 4 graphics card

A Century of Aviation Lucky Lindbergh

The Lago treatment for Lindbergh

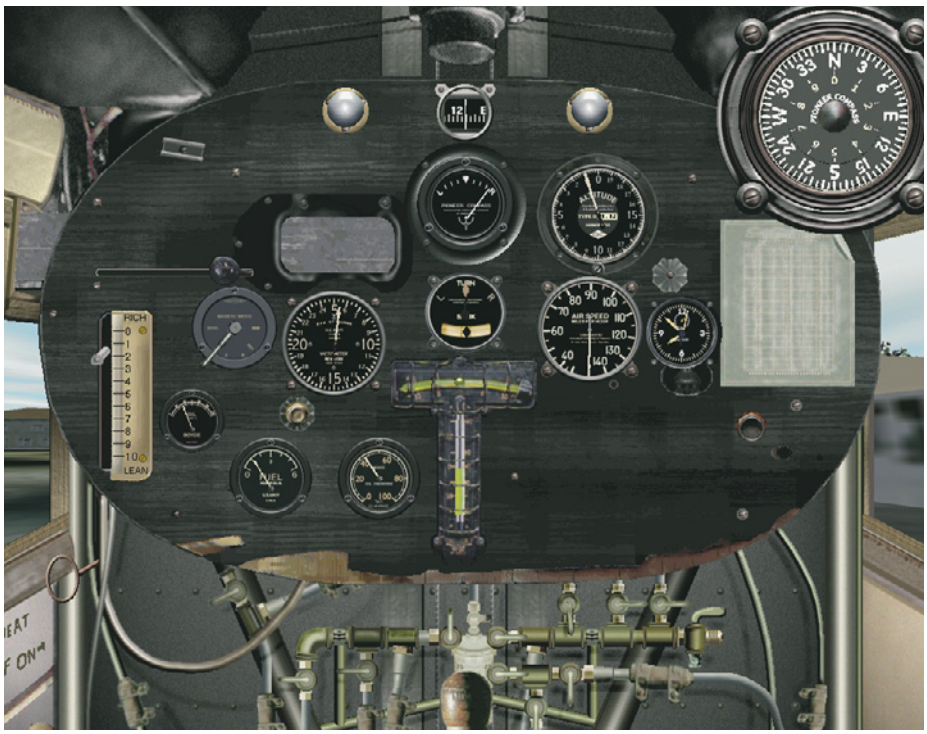
With the dawn of 2003 the aviation world has been celebrating the 100th anniversary of powered flight. Wilbur and Orville Wright knew they were making history on 17th December 1903, but they may not have envisaged quite how much their fragile Wright Flyer would change the world. Lago are celebrating the anniversary with their Century of Aviation series, and their first offering is arguably the most famous aeroplane in the world – the Ryan NYP Spirit of St. Louis that Charles A. Lindbergh piloted solo from New York to Paris in 1927. In Issue 19 we had a stab at re-creating this epic flight in FS2002 with Flight One's freeware Spirit of St. Louis, which left us with a huge respect for Lindbergh's achievement and a taste for seat-of-the-pants long-distance flying.

Rather than simply produce a basic Ryan aircraft expansion, Lago has created a complete package that follows Lindbergh's aviation career; it includes three aircraft, scenery of the start and finish airfields from the Atlantic crossing, fifteen saved flights that allow you to re-create the trip, and a couple more flights that utilise the other aircraft. Once the program is installed – while you listen to a jolly rendition of a popular 1920s hit about Lindbergh – you'll find you've also got a well-produced PDF manual that charts Lindbergh's aviation career and provides some comprehensive notes on the various aircraft.

The three aircraft in the package chart Lindbergh's career in aviation up to the late 1930s. If you follow the sequence logically, you'll begin with the Curtiss JN-4D Jenny; this sturdy, two-seat aircraft was developed during WWI as a primary trainer, and so many were built that the model had an active life right up to WWII and beyond. Thousands of pilots began their flying career in the Jenny and Lindbergh was no exception – he began by wing walking in a flying circus and earned enough to buy a war-surplus Jenny in which he soloed in 1923.

The view from the periscope – watch those telegraph wires!

The virtual cockpit view is less claustrophobic



Set the EI compass (top right) and follow the needle in the middle of the panel

View from the Sirius is marginally better than from the NYP!

The Lindberghs leave New York in their Sirius

By modern standards the Jenny is pretty cumbersome, and this soon becomes apparent when you fly it. With a top speed of 75mph and a stall speed of 45mph, it's as far removed from a modern aircraft as a horse and cart is from a Mercedes. Lago's model is beautifully rendered; there's a detailed engine and you can even see the grain in the wood textures. The foot step is modelled so that you can pan around the cockpit interior by looking through the hole in the fuselage by the wing. You fly from the front or rear cockpit, although the pilot isn't aware of this and refuses to budge from the back seat. This minor glitch aside, it's an enjoyable aircraft to fly, and comes with a virtual cockpit and a saved flight over New York's Central Park.

The next stage of Lindbergh's career was just a mouse-click away, and we were soon sitting in the Ryan NYP (New York-Paris), thankfully without having suffered the trials and tribulations that he went through to get finance and support for his ambitious project. As soon as you get behind the panel and click open the periscope, you can see the effort that has gone into reproducing the aircraft correctly. You can see from the screenshots that the view forwards is almost non-existent. In addition to piloting an aircraft loaded down with fuel over the sea for 33 hours, Lindbergh also had to navigate using only a small periscope to provide any forward view. The huge supplementary fuel tank was mounted in front of the cockpit and, as with every other non-essential item from sandwiches to mascots, Lindbergh dispensed with a windshield to make more room for fuel. The periscope works on this model (as it did in the Flight One Spirit) but once the novelty of opening and closing the slider has worn off, it's not much use. This was most likely the case in real life, and Lindbergh probably did most of his observation from the side window. You can re-create the effect by using the virtual cockpit.

The novel Earth Inductor compass is also modelled and actually works. Pressing [Shift]-[3] brings up the compass (it was normally by the pilot's knee) and you can set your desired heading. Then simply follow the direction indicator on the panel. If it says 'R', then fly to the right; 'L' means go left, and once the pointer is in the centre you're on course. Getting an important detail like this correct really adds to the feel of authenticity and Lago are to be congratulated.

The 15 included flight plans let you fly the various legs of Lindbergh's epic journey. They begin at Roosevelt Field, New York, where you get the chance to marvel at the authentic 1920s scenery, complete with the telegraph wires that Lindbergh narrowly avoided on take-off. They provide an equally perilous obstruction for the simulated pilot, so be warned (or turn off crashes). Open up the multimedia folder In the FS2002 main directory's Lago folder, play the .avi movie of Lindbergh taking off, and you'll see what we mean!

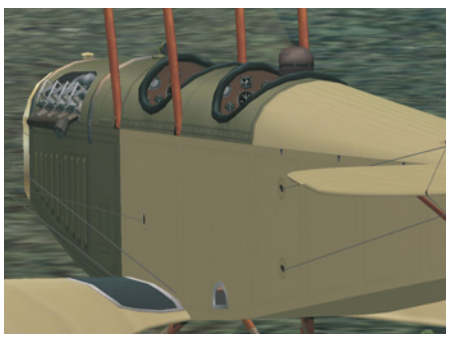
If you follow Lindbergh's journey and don't get lost, you'll arrive at Le Bourget at night, with the welcoming lights of spectators' cars to guide you in. Change the time to dusk or day and you can see the airfield in all its 1920s glory, although we found that frame rates tend to suffer as a consequence of the detail. The aircraft sounds and handles realistically, even down to the manoeuvrability improving as you use up the fuel.

After his sensational flight Lindbergh became literally the most famous man in the world and the consequent pressure and attention dogged him for the rest of his life. In the period following this flight, however, Lindbergh got involved at the ground level of civil aviation and personally pioneered many of the new routes across the US. After his marriage in 1929 he continued to do this across the globe, and bought a Lockheed Sirius floatplane as comfortable long-range transport. This is the third member of the Lucky Lindbergh trio, and although it shares poor forward visibility with the Ryan you can still see why he chose to travel the world in this beautiful aircraft. Lago's version has the quality, hand-built feel of the original and, as you manoeuvre around New York harbour in the saved flight, you can just imagine yourself setting off to trailblaze a route to Manila or Nicaragua.

This excellent package is well worth a look if you fancy something different, and the Atlantic flight is a challenge waiting to be taken up! We look forward to the Amelia Earhart package which is pencilled in for release soon. ■

Derek Smalls

On the grass at Roosevelt Field – an expectant crowd waits for Lindy to take off



Fantastic detail – you can even see inside the cockpit of the Jenny from the step

Review Score

Publisher: Lago

Price: €25.00 (£16.00 approx.)

Website: www.lagoonline.com

Developer: Lago

At a glance: A real change from the usual add-ons, in a quality package that provides fun and authenticity in equal measure.

System Requirements: PIII 750MHz, 128Mb RAM, 32Mb 3D graphics card

Recommended: PIII 1.2GHz, 256Mb RAM, 64Mb 3D graphics card

Aeroplane Heaven

A paradise for virtual pilots

One thing to come out of the dot.com boom, apart from ex-millionaires sleeping in cardboard boxes, is the less-publicised story of developers who have been able to successfully publish and sell their work by download from the Internet. Companies such as Flight One, PSS, UK2000 and many more are providing their software directly to the public by download, and whilst their latest aeroplane or scenery packages don't make a serious dent in the profits of high-street retailers, they are doing well and providing us with some first-class FS add-ons.

It seems that almost every day we hear about another group of talented individuals who are offering the public some flight sim software on payable download. Quite a few of these companies haven't got beyond the 'good idea' stage, but we thought we'd take a look at one group of relative newcomers to payware publishing who have already got some interesting aircraft that you can buy and fly today.

The Grumman XF-51 – available as a fighter or a racer

Australian-based Aeroplane Heaven (www.aeroplaneheaven.com) is one of the first companies we've seen to offer a variety of aircraft expansions for CFS3. The mix of planes available from their site is quite eclectic, and while many of their tempting offerings are still 'work in progress' there's quite a fair selection available for fans of older prop aircraft. The hangar area of their site is divided into four sections – WWI (1914-1918), The Golden Age (1920-1938), WWII (1939-1945) and The Jet Age (1950 onwards).

The aircraft currently available are restricted to the post-WW1 and WWII sections, but everything for sale can either be downloaded or supplied on CD, and the centrepiece of their collection is a complete Battle of Britain aircraft add-on for CFS2 (and FS2002) that has been updated to run with CFS3. Aeroplane Heaven also caters for non-combat fans and they've got a Hurricane racer and some Grumman XF-51 racers for FS2002, not to mention the excellent Grumman F-3 that was included on last issue's cover CD.

We were keen to take a look at the Battle of Britain 'Mega Pack' but when we came to make our selection at the site, it soon became apparent that an extensive choice is something of a disadvantage when it comes to working out what you are buying. You can select the complete pack with six aircraft (plus extra paint schemes) and five of them will work in CFS3 as well as CFS2 and FS2002. The Mega Pack also includes the Hurricane racer for FS2002, free scenery for RAF Coltishall and some extra upgrades. It looked like good value at around £14.00 for the download (or £18.00 on CD), but you can also select single aircraft for about £6.00 each, or pairs for £8.50.

Even Adolf Galland's moustache is authentic

Working out the various value options isn't that easy, so we suspect that most buyers will either opt for the Mega Pack or nothing at all. With our press sample we were given the option of downloading each aircraft singly in either an automatic or manual installation format, but with all the various aircraft, extras and versions it's quite time-consuming, irrespective of the speed of your connection. Once you've got your password, however, you can return to the page as often as you like. We asked the Aeroplane Heaven team whether they'd consider putting the whole pack up as a single download but they told us: "The Battle of Britain pack is enormous, and our research shows comparatively low penetration of cable and ADSL, so we have opted for byte-sized chunks to download.

The Hurricane racer beats up Reno in FS2002

Aeroplane Heaven's Hurricane should make you feel better about CFS3

Galland attacks!

Al Deere zooms out of Duxford in his Spitfire

We also, of course, deliver on personalised CD with everything on it at a slightly higher cost to cover postage." Sound thinking, as tales of woe from dial-up modem users increase along with the size of FS downloads.

We gave the aircraft in the package a thorough run and, as you can see from the screenshots, the Hurricane looks fantastic in CFS3. Quite a few paint schemes are available for famous pilots, including Al Deere, Douglas Bader and Adolf Galland, although not all for CFS3, as far as we could ascertain. The aircraft are modelled to a high level of detail (right down to Adolf Galland's moustache) and are extremely responsive. Aeroplane Heaven don't hold back with the claims for their aircraft and told us: "Aeroplane Heaven wishes to be known for its almost maniacal attention to detail and authenticity. All our releases have enormous amounts of working detail and special animations. The pilots, for example, turn their heads into a turn. Their arms and gloved hands operate the control sticks, flap levers and other equipment depending on the model. The goggles they wear are glazed and reflective."

Excellent detail in the 109 cockpit

Another novel feature of this development team is that they can build to special order for virtual squadrons who want their own aeroplanes to fly online. This involves a custom model and sets of personalised paint schemes for the squad members, including codes, nose art and names on the cockpit. They are currently working on a version of the Grumman Panther for a squad of US Marines who have their own online community. Prices are very much upon application, so drop them a line if you're interested.

Flying the Aeroplane Heaven aircraft for a while certainly bears out their claims about quality, and if they finish even half the projects they're planning then we'll be expecting them to be up with the big boys of the payware world before much longer. ■

Eric Childs

Coming soon to a modem near you from www.aeroplaneheaven.com

Aeroplane Heaven has got some big plans for aircraft releases over the next few months:

Grumman F-9F Panther jet (fighter and photo-reconnaissance versions)

Hawker Hunter Jet (prototype, record breaker and FGA.9 versions)

Bristol Bulldog biplane fighter of the 1930s

Fairey Flycatcher biplane fighter of the 1930s

P-51 Mustangs (P-51 A, B, B 'Malcolm Hood' model and D versions)

Supermarine Spitfire (12 versions in one pack)

Hawker Hurricane (4 different versions)

Avro Lancaster (Three versions)

Bugatti Racer (Little-known Bugatti masterpiece from 1938)

Airco D.H.2 WWI fighter

Fokker DVIII WWI fighter

S.E.5A WWI fighter

Mosquito (four versions)

Take a look at the detail on this D.H.2 – you can almost smell the castor oil!

Apple Aviation?

If it's good enough for X-Plane...

There are a few words that flight simmers find synonymous with their hobby: DirectX, Windows, PC and Microsoft. Likewise there are some words that instantly sound wrong, such as Apple, Mac OS and Macintosh.

When was the last time you heard someone talk excitedly about a new flight sim coming soon for the Macintosh, or the last time you walked into Game only to be bombarded with glitzy marketing displays advertising the latest and greatest Mac flight sim? These are all rhetorical questions, since everyone knows that the Macintosh has no place in the mainstream gaming market, let alone in the small niche market that flight sims inhabit. Apple, however, want to change all that.

Now that Christmas is out of the way, chances are that you will come across more Mac users than ever before. Apple has consistently been the number two best selling *brand* of computer in the world (although 95% of computer users still prefer the PC), so we're hardly talking about a threat to Microsoft here, or any real threat to the PC. That's not at all what Apple Computer Inc. is all about these days; while the PC is pretty much the computer industry's jack of all trades, performing tasks ranging from running mission-critical lines of business server tasks to ordering the weekly groceries online from Tesco, Apple are quite happy to have their baby dominate the educational markets, in the US at least, the creative sector and, increasingly, make in-roads into the home.

There's no denying that the new line of Macs are things of beauty; shimmering pearlescent colours have a certain degree of elegance compared to the traditionally dull greys, whites and beiges of the PC world, but what are they like to use? Are they any good as flight sim machines? Before looking at what's available to fly on the Mac, it's worth taking a quick look at the hardware and systems available.

The hardware

Apple currently have five models in their Mac line: the eMac (education Mac), iMac, Power Mac, entry-level iBook notebook and the high-end Titanium PowerBook. With the exception of the entry-level iBook, all machines run at least one G4 processor; this is the Apple alternative to the Pentium, Athlon, Celeron and Itanium CPUs found in PCs. The G4 is a phenomenally powerful processor, so powerful in fact that it is classified under US export regulations as a weapon. There have been no reports of anyone battering their enemies to death with a G4 processor; the regulations refer to the processor's ability to handle missile guidance with ease.

Intel have done a great job at marketing the MHz and GHz ratings of their processors, and so Apple have no choice but to follow suit. Comparing the quoted speeds of a G4 and an Intel-compatible processor, however, is of little value. The MHz and GHz measurements really do nothing more than allow you to compare two processors of the same family, measuring roughly the number of times the processor gets electrical current and is able to do something per second. It's easy to compare an 800MHz Pentium III to a 1GHz PIII and tell which is fastest, but it's not so easy to compare a 1GHz P4 with a 1GHz PIII. The P4 is actually considerably faster by virtue of the way it works.

The same applies to G4s and Pentiums. The top-of-the-line Power Mac sports two

Considering the price, the Virtual Wings IFR trainer is a bargain

1.25GHz G4 processors, which on the face of it would make it slower than a single-processor-based 3GHz PC. That's not the case, though, in raw processing terms at least. G4s sport something called a Velocity Engine, a neat bit of technical wizardry that allows a G4 chip to perform more than one calculation in a single instruction. This allowed the G4 to become the first processor in the world to achieve super-computer status by performing more than one billion real instructions per second – something known as a Gigaflop. The Power Mac currently runs at 18 Gigaflops, and the raw processing power of a dual-processor 1GHz G4 is roughly 70% more than that of a 2GHz Pentium 4.

If processors were everything we wouldn't spend so much on continually upgrading entire machines. There's an old adage that a computer will only ever run as fast as its slowest component, and this is where the Macs are let down.

While PCs now routinely ship with motherboards that can shift data between processor and video card at 300MHz, the Mac still features a 133MHz bus. So while the processor itself is blisteringly fast, the computer's ability to get data to and from it in a hurry is severely limited. Long-time Mac advocate and X-Plane developer, Austin Meyer, likened it to "putting a Ferrari engine into a Model T Ford when it comes to pushing polygons across the bus to the video card. The Mac is a lot slower than a top-of-the-range Windows machine". This is a crying shame, and Apple is aware of it; there are rumours that the G5 Macs currently in development will have a much faster bus.

The motherboard speed really is a serious issue for the Macintosh. Macs use the same IDE-based drives as most shop-bought PCs, and ship these days with the same high-spec Radeon- and GeForce-based cards.They have oodles of memory backed up by a phenomenally powerful Unix-based operating system (Mac OS X, also known as Jaguar), and so with the power of the G4 there is no reason why Macs shouldn't be every simmer's dream – except of course for the bus speed and, as we'll see, the availability of FS software.

On the all-important graphics front, the choice of graphics accelerators for the Mac is somewhat smaller than for the PC. The PowerBook line currently ships with an admirable Radeon Mobility 9000, with either 32 or 64Mb of RAM on board, depending on the configuration of the PowerBook in question. G4 Power Macs ship with either GeForce4 MX or Ti cards, or the Radeon 9000 PRO, while the iMacs use GeForce2 MXs on the lower-spec 15-inch screen machines, and GeForce4 MXs on those sporting a 17-inch screen. For flight simulation, that's about as far as you can go.

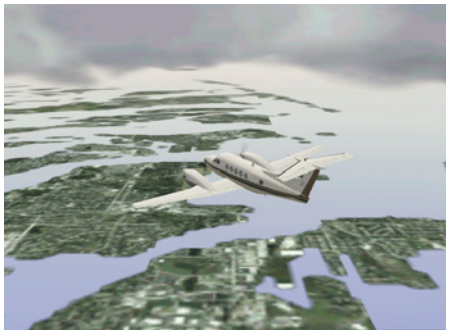
IFR training from Elite – available to both PC and Mac users

Unlike PC users, replacing the original Mac graphics card when the latest and greatest GPU arrives on the market is not quite as simple as opening the case and inserting a new card. Apart from the fact that iMacs simply cannot be easily upgraded at all (it's easier for Power Macs), very few third-party graphics hardware manufacturers produce drivers for the Macintosh. If you want the newest graphics hardware you really have to wait for Apple to produce the drivers and then make them available as a system update.

This isn't as big a bind as it might seem. With the somewhat limited bus speed in the current Macintosh line-up, it's hard for the computer to even throw data at a GeForce2 MX card fast enough to keep it busy. The extra power provided by a GeForce4 Titanium card really is wasted. On the other hand, Mac OS X provides stunning support for OpenGL, the toolset that many developers use to actually produce 3D graphics at runtime within games. When you couple that particular standard to the fact that the OS is based on Unix, a twenty-year-old operating system used by millions of accomplished developers, it's not surprising that many publishers are starting to look to the Mac as an alternative revenue source.

Apple of course realise this, and with their partners are doing all they can to both attract developers to the platform and keep them. X-Plane, for example, is a cross-platform product available for both Windows and Macintosh, but one which is developed purely on Macintosh. "When it comes to code development, the two versions are really the same," Austin Meyer told us. "The Windows versions are not different at all."

The trick is, of course, to start out developing a new flight sim with Windows alternatives in mind. Tony Pollard, the boss of Neutral Ltd (developers of the forthcoming Mac port of Comanche Versus Hokum) told us that the publishers' attitude to Macintosh is purely down to "Is this a Class A title or not? The big commercial publishers generally won't build in Mac as a platform to launch on from day one. If you do build the code to move to different platforms from day one, though, porting is a very cheap thing to do." This is exactly how Austin Meyer manages to simultaneously support, develop and maintain two different platforms for X-Plane, despite being one of the smallest development shops out there.



The Fly! series for Macs is well supported

The software

The FS market for the Macintosh is quite strange, compared to that for the PC. There are a few big names that will be familiar to most of you, and also some that probably won't be. By far the largest share of the market belongs to the latter,

Mac Space Wings

The Orbiter programme has plenty of fans and a growing add-on development community, as does space flying in X-Plane, but there is another amazing space sim out there that's been in constant development as a Mac-based sim for almost a decade – Joseph Nastasi's A-OK! The Wings of Mercury (http://www.youarego.com).

It's a realistic simulation of the Mercury spacecraft, with a control panel which includes 120 fully functional switches and gauges that require the actual checklists and flight plans used by the real Mercury astronauts. The list of features is fascinating – among them a Booster Editor, Mission Profile Editor, variable weather conditions, Mission Reports and biological and psychological factors affecting individual astronauts. There's even a separate Mission Control Centre simulation that can be networked to the main simulation.

Systems rather than views are obviously the most important element of the sim, but once you start getting involved in the cockpit you're not going to have any time to worry about enjoying textures and external detailing touches!

Joe tells us that the initial market focus of Wings of Mercury was on education, where particularly in the US there are still a substantial amount of Macs. "To do any sort of solid business in the sim enthusiast market," he tells us, "you obviously have to have a Windows product. I get a LOT of requests for A-OK! Wings of Mercury on Windows. Daily." Hopefully the PC version, expected to be available in a few months, will bring a superb program to a greater number of FS users.

The complete simulation, recently upgraded to full compatibility with Mac OS X, sells for £39.81, and a batch of future upgrades are included in this price.

and more often than not these are sims designed purely for teaching purposes, as opposed to providing an enjoyable home entertainment experience.

Fly! and Fly!II, which still have their devotees, are available for the Macintosh at the current time, and are both identical in their operation and behaviour to their PC counterparts. Apple are making much of this; their website points out that PC users need to download an extra 862Mb of additional data to get all the updates, and that the Mac version of Fly!II is ready to fly straight from the box. Worth noting is that the recent patch for Fly!II is available for both Macs and PC.

X-Plane is still the only real choice for Mac users

There's the venerable X-Plane, which is quite unique in that the vast majority of community-developed add-ons are developed by Mac users rather than PC users. Over to Austin once again: "When you go to the subculture section of X-Plane.com […] the vast majority of those pages were developed on Macintosh, not Windows, machines. Mac users are much more likely to develop scenery and airplanes and things like that". PC users, it would seem, prefer to devote their energies to Microsoft's family of sims.

Austin also told us that the Mac user base probably accounts for just 30% of the total user base of X-Plane. Since it's this 30% which account for most of the community feedback, it would be interesting to see what the freeware add-on scene for FS2002 would be like if it were a Mac product. Thankfully, we won't have too long to wait to find out; the Mac flight sim community is eagerly awaiting an announcement from US-based Destineer Studios (www.destineerstudios.com) about their progress on a release dates for the Mac version of Flight Sim 2002, although by then it's likely that PC users will be looking forward to the arrival of FS2004.

Other 'familiar' sims include Falcon 4.0, and Fighter Squadron, which is now a PC budget title available from Focus and selling at £9.99. Warbirds III (www.totalsims.com), one of the more popular online combat sims, is also available for Macintosh.

Leading the more commercial front of the Mac flight sim world are F/A-18 Korea Gold and F/A-18 Hornet, both from Graphsim (www.graphsim.com/games/games-sims.html), a leading developer of unique Mac titles as well as one of the leading Mac software porting shops. Korea Gold is really just an update to F/A-18 Hornet, a sim that has been around on the Mac for about eight years, and is a long way from the cutting edge of combat sims. Despite its age and the outdated graphics, it has a devout following in much the same way that Falcon does on the PC. F/A-18 models all the systems of a Hornet very well and performs well, creating a wonderful feeling of speed, especially at low level. As with most Mac flight sims, it supports all standard USB devices, which means that any existing investment in joysticks and throttles will work just fine. Enemy Engaged also should soon make an appearance on Macintosh, in spite of this being a vintage sim that's now available at a budget price for the PC. Information on future Mac releases is likely to be available first at www.macflightsims.org.

Away from the mainstream end of the market, things are a little more up to date. Cat III Systems' Virtual Wings

Not exactly cutting-edge, but F/A-18 Korea Gold is entertaining enough

(www.cat3.com) is an IFR trainer which features the Piper Warrior, Archer and Turbo Arrow. Elite Simulations' (www.flyelite.com) IFR trainers are likewise expensive high-end professional simulators designed purely for educational purposes.

These aren't the sort of products that you wander down to Dixons and buy off the shelf. Elite Pilot will set you back around £125.00 for the sim with a built-in Cessna. If you want to buy additional aircraft, such as the Cessna 182 or Mooney M20J then you'll need to cough up about an extra £30.00 for each aircraft. Virtual Wings is far more realistically priced, at around £63.00, but bearing in mind that this is for an FAA-approved training device that can be used in the States to log ten hours towards your pilot's licence, this is a bargain.

The nature of these sims means that none of them provide anything stunning in the graphics stakes, in spite of providing a highly convincing flight experience, and all are put to shame in this respect by even the lowliest home flight sim on the PC. Elite have improved this aspect with their GenView system, which generates reasonably realistic landscapes – but only so far for PC!

The PC market completely outstrips the Mac flight sim market at the moment, by sheer virtue of volume of titles and the inescapable fact that almost everything arrives on the PC first. In some respects this is a shame. Despite its phenomenally powerful processor family, the current Mac line is still out-performed by high end PCs, but Macs do have a number of points in their favour. They are stable, rarely crash, and are easy to use and maintain. The other thing that Macintosh has going for it is not well publicised, and that's longevity – Macs age far less than PCs. Despite the speed of the graphics being considerably lower on a Mac, their processing power does lend itself to stable, fast mathematical simulations of flight models. When Carter Copter (www.cartercopters.com), for example, decided they needed a computer-based simulation of their prototype aircraft, they settled on a Power Mac running X-Plane.

The Comanche Hokum – soon to be on Mac, but the fact that it's two years old means that it's been relegated to the budget PC software racks

Is anyone likely to abandon their PC in favour of a Macintosh? The answer really has to be no for anyone who's not an exclusive X-Plane pilot. Macs may boast wonderful looks, powerful processing ability and wonderful graphics, but when it comes to desktop flying they are still a long way from affording the choice and flexibility that the PC provides. ■

Peter Wright & Heather Wright

COMPETITION

Don't forget to enter!

If you like the look of Forgotten Battles, and fancy sprucing up your system with a new monitor and joystick, we've got the very thing. Ubi Soft, publishers of Forgotten Battles and all-round generous people, have kindly donated a prize of a Hercules flat-screen monitor, Thrustmaster joystick/throttle combo and a copy of Forgotten Battles for the winner of our competiton. There are also five runner-up prizes of copies of Forgotten Battles up for grabs, so get out your Russian phrase books and don your fur-lined thermals!

1) **1) The Lead Designer of IL-2 Sturmovik and Forgotten Battles is:**
   a) Oleg Mattock
   b) Oleg Maddox
   c) Oleg Matrox

2) **2) The Bell P-39, which was flown by the Soviet Air Force, was known as what by the Allies?**
   a) The Airacobra
   b) The Kingcobra
   c) The Vanguard

3) **The Russian city of Volgograd was known as what during the war?**
   a) Vladivostok
   b) Stalingrad
   c) Leningrad

Send us your answers together with your full name, address and e-mail address (if you have one). The competition closes on 31 March 2003 and prizes will go to the first six correct entries drawn at random from the assistant editor's beret.

This competition is open to PC Pilot readers across the globe with the exception of PC Pilot staff and that bloke who keeps sending multiple e-mail entries! Send your answers by e-mail to comps@pcpilot.net or on a postcard or the back of an envelope to:

Forgotten Battles Competition, PC Pilot, PO Box 11, St. Ives, PE27 3GW, UK

Weather Generation Programs for FS2002

Blue skies, smiling at me…

Although the weather in FS2002 has progressed enormously from the strange-looking objects that filled the FS98 skies, it still has some way to go before clouds have that genuinely translucent quality, rain looks like real water, and sunsets fill the virtual sky with perfect orange and golden hues. But advances are being made…

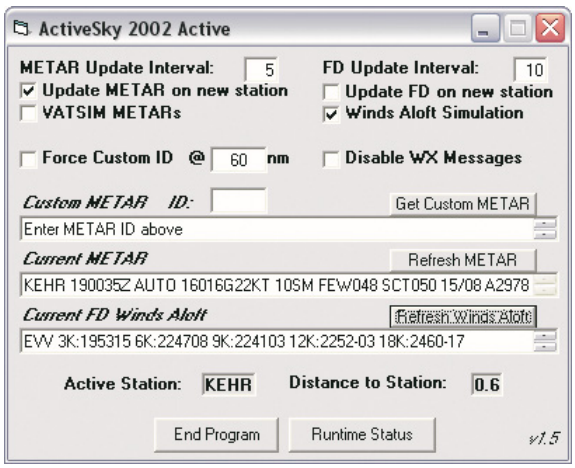
There have been a few earlier attempts to improve weather simulation, with products such as FS Clouds and FS Weather from Flight 1, but these were somewhat constrained by the graphics available at the time. Now that the hardware is finally catching up (almost) with the demands of the software, can we expect to see a perfect representation of those stormy tropical skies, heavy with the most foreboding deep purples, while flashes of lightning rip through the sky?

Not just yet, unfortunately, but until then it's worth exploring a few of the add-ons designed to improve your simulated weather. Anyone who's ever been baffled by that part of the TV weather report which doesn't show the symbols for sun and rain will know that meteorology is a complex subject with no shortage of accompanying jargon, but for little or no cost there's plenty of software that will bring you one step closer to the concerns and abilities of real-world pilots.

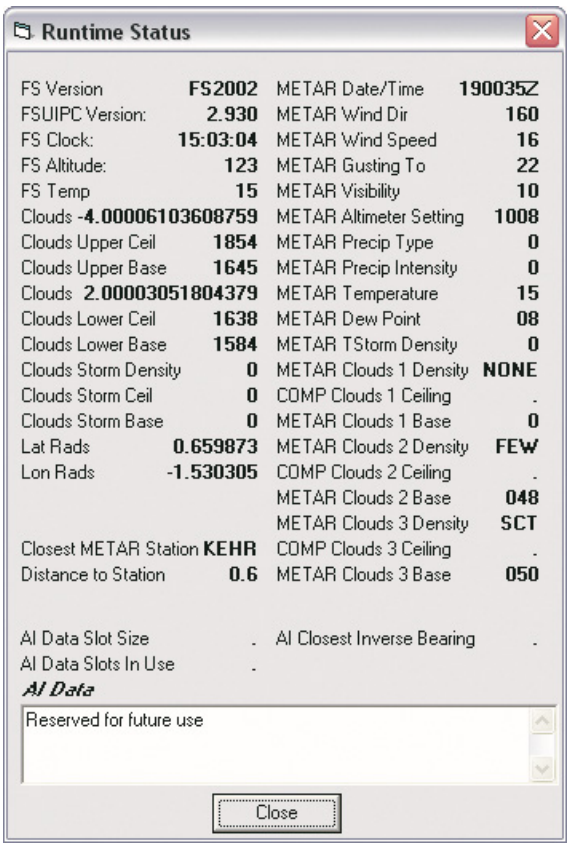
It's interesting, incidentally, to see that weather interpreted from real-world data always looks more realistic than that created from any manual settings in FS2002, which just underlines the fact that you can't improve on nature!

ActiveSky

In common with many similar add-on programs, Damian Clark's freeware product,



ActiveSky 2002's METAR menu



ActiveSky 2002's status menu

ActiveSky is the only program to display the METAR data within FS2002

Watch out for that wake turbulence in ActiveSky

ActiveSky 2002, works independently of FS2002 but communicates with it via Peter Dowson's excellent FSUIPC utility (version 2.8 or above). What it does, essentially, is automatically download METARs from the closest reporting station to your present position, and then transcribe this data to provide accurate weather representation within FS2002, mirroring exactly what's happening out there in the real world.

The program also simulates the behaviour of high-altitude winds based on currently reported surface winds. If you want to simulate the conditions in a specific area, you can force the change by entering the Station ID. This is active up to 60 nautical miles away, and will produce an accurate ATIS report based on the METAR. A ticker-tape-style message is displayed across the screen every time the information is updated, but if it becomes distracting it is possible to disable this feature.

What might seem like a complex procedure is actually very easy to set up, and the difference it makes is quite remarkable. It's surprising how bland the default clouds and weather look once you've experienced the improvements. The visuals are noticeably more realistic, and the drift effects of winds aloft can severely interfere with navigation for the more casual VFR aviator. Obviously, you could define the parameters yourself, but the constantly and subtly changing conditions created automatically by ActiveSky take some beating.

If you like the look of ActiveSky 2002 and want something even better, then Damian has recently released ActiveSky wxRE. You'll have to pay for this version, but the price is reasonable and it uses a new weather environment engine featuring smooth cloud transitions, dynamic processing via TAFs, and realistic icing and fog effects. The briefing interface is a handy feature, letting you check on conditions for your flight all the way from the point of departure to your destination and alternate airport.

Also included is the provision to create realistic wake turbulence from AI aircraft, meaning that you'll have to take extra care around busy airports. If you'd like to find out more without committing yourself, you can download the user documentation from the ActiveSky website without having to buy the program first.

FS Meteo

The brainchild of Marc Philibert, FS Meteo is compatible with FS98/2000 and CFS2 as well as FS2002, and again generates weather from data sourced from the Internet, using one of four methods. The default requires a continuous connection such as those provided by cable modems, ISDN or DSL services, or you can use a high-speed connection via a LAN, if available. If you're using a standard modem, FS Meteo will automatically dial up your ISP every six minutes and download the weather at your aircraft's current location. The connection is dropped between these updates so as to save your phone bill. Continual updates

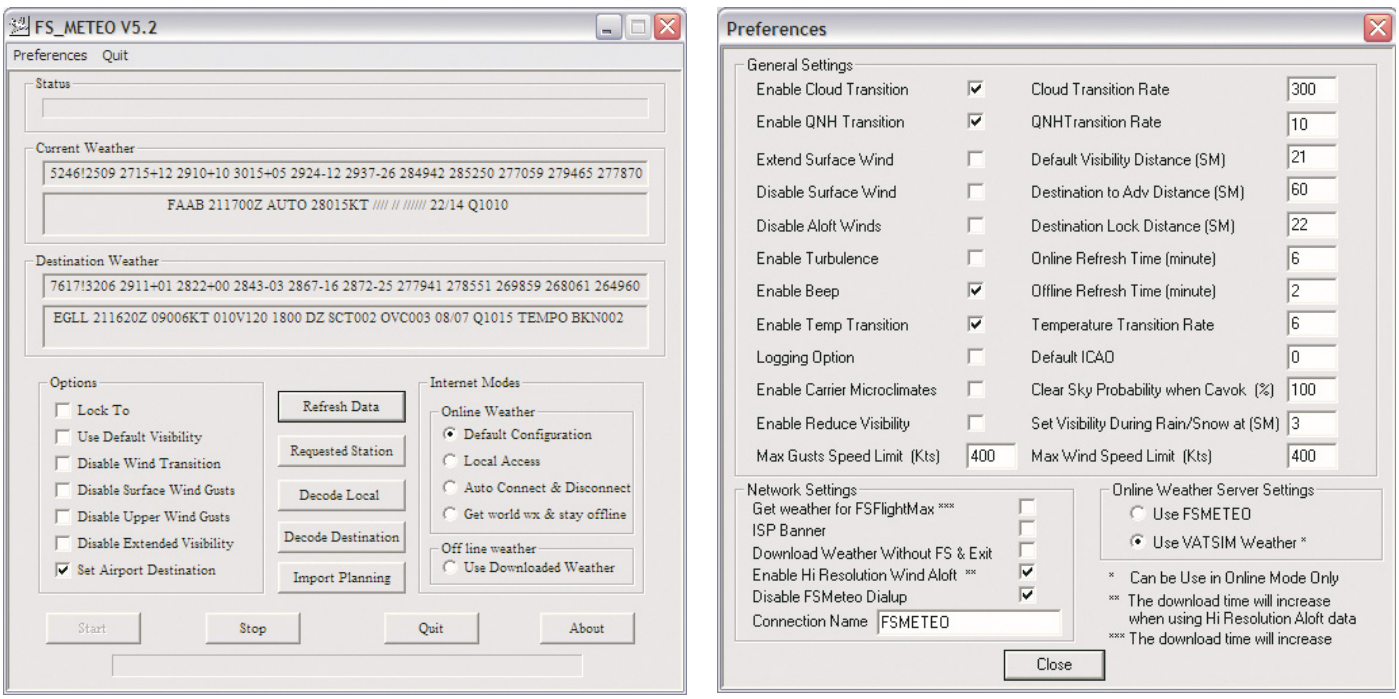
Heathrow's down there somewhere… (FS Meteo)

mean that if real-world weather conditions are worsening or improving along the route of your flight, that's exactly what you'll see happening to your simulated weather.

Finally, if you're not too concerned about absolutely up-to-the-minute weather, you can dial up and get the worldwide weather in one hit and then use this data for your flying session. The information won't be as accurate as that coming from a continuous connection but, unless you're on a particularly long flight, it will be authentic enough for many.

The program collates data regarding temperature, precipitation, barometric pressure, visibility and wind, derived from online METAR data or VATSIM and downloaded from the FS Meteo server. As with most of these weather-generating programs, FS Meteo interfaces with FSUIPC, providing many new settings to tweak, and includes current METAR reports for any designated ICAO station. This feature can be locked, for example to your destination airport when you are about 60 miles away, so only the relevant data is sent to Flight Simulator. Then, as you make your approach, the ATIS and any adventure-generating programs you might be using can adjust your headings and runway designations to suit the current conditions.

Weather Display is well worth the money as an in-flight complement to FS Meteo



The FS Meteo interface and Preferences menu

Identical weather interpreted differently

These screenshots were taken at exactly the same location, using the same downloaded weather data, for purposes of comparison. They're clearly not identical, because all the programs translate the weather data into FS2002 slightly differently. If you tried another entirely different type of weather, the resulting conditions displayed would again look slightly different. Just as predicting the weather itself will never be an exact science, nor will the representation of it be in flight simulation. Your best bet is to find a program that either models certain weather features which you particularly want (wake turbulence, for example), a user interface which you're happy with, or software features which work faultlessly with your PC and simulation setup.

It's actually quite difficult, with a subject as variable as the weather, to differentiate precisely between programs which attempt to provide a realistic environment; even switching between programs and reloading FS2002 in the same area is not really conclusive, because there's no guarantee that conditions will remain constant and it's not always clear where the generating data is drawn from. With freeware products, however, or those which allow you a free trial period, it's worth downloading them and seeing which one you feel most at home with.

ActiveSky 2002

FS Meteo

Weather Center

ATIS (Automatic Terminal Information Service)

A recorded message of current airport information, which includes the latest weather – usually broadcast on VOR or on discrete frequencies which won't interfere with ATC communications.

METAR (METeorological Aerodrome Report)

Coded descriptions of the actual weather conditions at a specific time and place. They are usually issued every half hour, and the data is always provided in the same order.

TAF (Terminal Aerodrome Forecast)

These are available in the ICAO format for airports that produce regular METARs. They give a forecast, rather than a report of the weather conditions. They are generally valid for a nine-hour period, and are updated every three hours. To help with planning long-haul operations, some international airports will have a longer TAF, which is valid for eighteen hours and updated every six hours. Aside from date and time of issue, and validity time and date, they generally follow the same format as a METAR.

SIGMET (SIGnificant METeorological message)

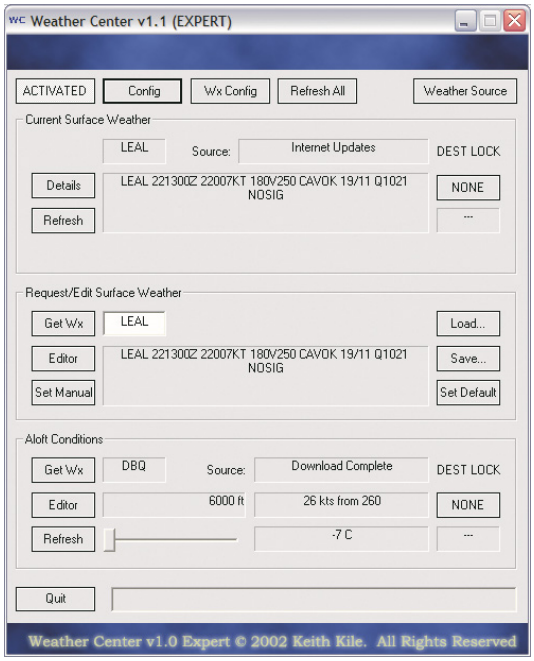
A brief message, written in abbreviated plain language, concerning the occurrence, or expected occurrence, of specific en route weather phenomena which may affect aircraft safety. These come from designated meteorological watch offices, which are responsible for FIRs (Flight Information Regions). The format of SIGMETs is rigidly structured, and many of the abbreviations used are the same as those used in METARs and TAFs

AIRMET

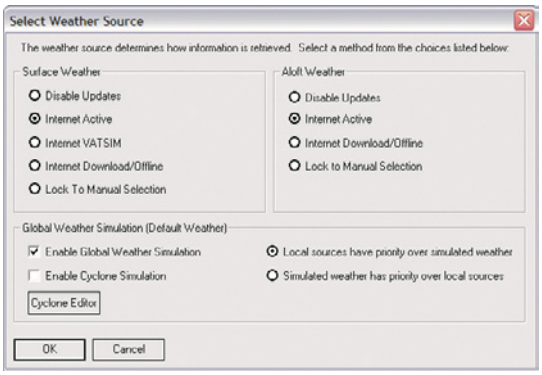
A concise forecast intended for low-level aviation, using abbreviated plain language. They are applicable to aircraft normally operating up to FL100, or FL150 in some mountainous regions. The format does vary from country to country, but all AIRMETs include many common elements. In the UK, AIRMETs are produced for eight geographical areas.

VOLMET

An in-flight ground-to-air transmission of Met reports and forecasts for several aerodromes within a particular FIR. They are read as plain language versions of METARs and are usually updated every half hour.



Weather Center's main interface



Selecting the source in Weather Center

A fine day doesn't show off Weather Center's real abilities

That's more like it!

Similarly, at startup the weather for your default airfield will automatically be downloaded ready for you to fly. An unusual option is the ability to enable aircraft carrier microclimates; this forces the wind to be orientated so that carrier landings and take-offs are always into wind.

FS Meteo is remarkably easy to set up and use and, as before, it's quite a revelation to see the difference realistic weather makes to your flights.

Accompanying the program, and available to buy for a little extra, is a handy utility called Weather Display, which continuously displays on screen your current weather conditions and those at your destination airport, without having to access the FS Meteo menu; alternatively, it'll display the state of the winds aloft.

Weather Center

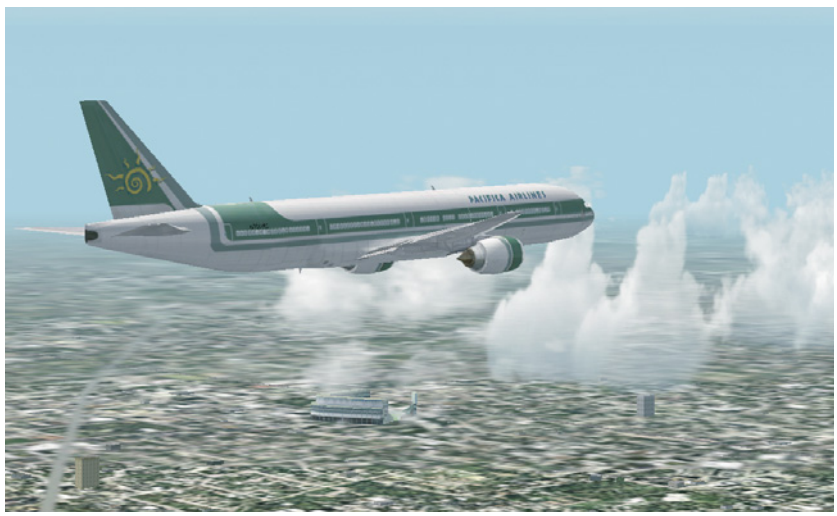
The Weather Center payware program can be tried out as a Novice version so you can decide whether or not to buy; this version works for fifteen minutes in exactly the same way as the full Expert version, but then disables many of the advanced features of the Expert program. These include smooth transitions between weather zones, the simulation of variable winds and convection systems, and the cyclone simulator. Yes, you can even find out how well you can deal with flying through a cyclone.

As with the previous products, Weather Center uses the Internet to gather weather reports, in this case for over 3,500 airports. Depending on the type of Internet connection you have, the data can be continually updated at a configurable rate, or it can be downloaded as a global report which can then be used for offline flying.

The program collates METARs of surface weather and selected winds aloft to provide a complete picture of the weather at your aircraft's current location.

The user interface is divided into three specific areas, with the main dialogue providing information about the currently selected source. This includes an up-to-date METAR, the origin of the report, and buttons to refine the data if you wish. You can also save the data and reload it at a later date, to

Weather Maker works differently to the other programs here...

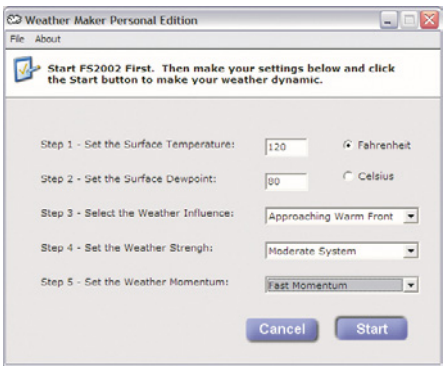


... but the results are equally impressive

When the worst is best!

If you want to test your skills against the very worst that the weather can throw at you, take a look at www.awfulweather.com. It's a wonderful site for anyone looking for weather conditions that any sane pilot would do their best to avoid, and will show you where you can find the worst real-world weather of your choice. You can search reports of dreadful weather, and even search for somewhere currently undergoing the conditions you want, by entering your own parameters for thunderstorms, rain, snow and more. Not for the faint-hearted, but hugely entertaining!

replicate the weather conditions for another flight. As with FS Meteo, there's a facility to lock the surface conditions for your destination airport. You'll find that a number of add-ons require this destination locking in order to determine the correct approach vectors for the appropriate runway.


Weather Maker Personal Edition
File About
Start FS2002 First. Then make your settings below and click the Start button to make your weather dynamic.
Step 1 - Set the Surface Temperature:
120
Fahrenheit
Step 2 - Set the Surface Dewpoint:
90
Celsius
Step 3 - Select the Weather Influence:
Approaching Warm Front
Step 4 - Set the Weather Strength:
Moderate System
Step 5 - Set the Weather Momentum:
Fast Momentum
Cancel
Start

The straightforward interface in Weather Maker

Back home just in time (Weather Maker)

Weather Maker

The three programs we've just looked at generate weather in your simulator using real-world data, whereas Weather Maker takes a totally different approach. The author, Reed Stough, has very much simplified the task of creating realistic weather fronts with an interface that has just five settings. You begin by setting the surface temperature and dew point in either Fahrenheit or Celsius, then set the conditions that will affect the building of the weather model itself. It could, for example, be under a low or high pressure system, with an approaching cold or warm front. Finally you set the strength of the approaching system and its momentum; this will determine the intensity of the weather system you're building and how quickly it will develop.

Once the settings are entered, simply switch to Flight Simulator and wait for the weather you've created to appear. If you want it to depict the weather at your current location accurately, you'll need to enter the temperature and dew point information we've already mentioned, together with the forecasted trends. This isn't a problem, because this data is readily available on the Internet from sites such as www.worldclimate.com, www.weather.unisys.com or www.rap.ucar.edu/weather.

The resulting weather depiction is very good indeed, and changes and develops in a realistic and unpredictable fashion. In just a few minutes we managed to create a weather system that you really wouldn't want to be flying in. Shortly before going to press, the author informed us that a Professional version of Weather Maker is under development; this will allow Flight Simulator users to dynamically change the weather conditions within a specific area simply by dragging and dropping weather symbols onto a map, after first setting up the parameters for each particular symbol. We'll keep you posted…

Joe Lavery

Weather downloads

Active Sky (http://hifi.avsim.net/activesky)
Freeware

ActiveSky wxRE
$14.95 (£9.00 approx.)

FS Meteo (www.fsmeteo.com)
€29.00 (£19.00 approx.)

Weather Display
€18.00 (£12.00 approx.)

Weather Center Novice Version
(www.simulationwidgets.com)
Freeware

Weather Center Expert Version
€16.00 (£10.00 approx.)

Weather Maker (www.calibresoftware.com)
Freeware

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Thunder and Lightnings

On your Machs, get set, go...

After last issue's supersonic switch of Concorde from FS2000 to FS2002, many of you wrote to us asking if there were any other high-speed thrills to be had with Flight Simulator. There is, of course, another Mach Marvel – the legendary English Electric Lightning...

(photo: Max Dereta)

We wondered if Lightning flight was possible on a simulator and, deciding that no article about high-speed flight would be complete without mentioning the record-breaking SR-71 Blackbird, we decided to try out both these supersonic wonders up in the FS2002 skies.

Since WWI the RAF has used a number of fighters that have gone down in history as classics – the Sopwith Camel, S.E.5A, A-W Siskin, the Hawker Fury and Hurricane, and the Supermarine Spitfire, to name just a few – but it's undoubtedly the Lightning that's the most fondly remembered RAF aircraft from the jet age. There are a number of reasons for this, but a major one must be the memory of Lightning displays at the Farnborough Air Show during the 1960s. If you think the sound of a pair of Sukhois setting off car alarms is impressive, imagine nine Lightnings performing a 250ft-low pass at 550 knots and then lighting re-heat. Modern health and safety advisors would have a fit!

The Lightning began life when the Air Ministry ordered a supersonic fighter in 1947, and the initial design was by W.E. 'Teddy' Petter. The prototype P.1 flew in 1954, and was the first British aircraft to exceed Mach 1 in level flight; by 1957 the P.1B could achieve this speed without re-heat. Later versions were stonking along at Mach 2.27, and one pilot famously referred to it as a "metal firework" – it could take off and climb to 36,000 feet in two and a half minutes, with an initial climb rate of 50,000 feet per minute! The F.1 variant entered RAF service in 1960 and the Lightning, originally planned to last for just ten years, soldiered on until 1988. Most of the modifications made to it were designed to increase its service range, as the two Rolls Royce Avon engines' huge thirst for fuel meant that flexibility in its deployment was very limited, although in its designated role as an interceptor it had few equals.

The best way to understand the design philosophy of the Lightning is to imagine trying to improve the performance of an MG Midget by fitting a supercharged V8 engine. Not a pretty solution, but spectacularly exciting! The Lightning was the first (and probably the last) all-British supersonic fighter, and while the Lightning's replacements (the Phantom, F-15 and Tornado ADV) are good aircraft in their own right, none of them can compare with the brute force and sparkling performance of the ultimate jet sports car.

The Alpha Lightning panel – plain but functional

The virtual cockpit is better

Alpha's F.1A is up and looking for Tupolevs over Fylingdales

Across the Atlantic, meanwhile, the US was waging the Cold War at very high altitudes with the U-2 spy plane. At least three years before 1960, when Gary Powers was shot down over Russia in a U-2, the CIA realised that this type of aircraft was extremely vulnerable unless they flew VERY high and VERY fast. They commissioned design studies from Lockheed and Convair for a Mach 3 aircraft that would fly above 80,000ft, and Lockheed's design won the day. The A-12, codenamed Oxcart, took to the skies in the early 60s under the control of the CIA. Not wanting to be left out, the USAF ordered a two-seat reconnaissance version that was to be designated SR-71 – this was the Blackbird. Although much of its history is shrouded in secrecy, it seems that the theory of high altitude and speed was sound. SR-71s are said to have dodged over 4,000 missiles in their operational life, and not one has ever been shot down. One of the Blackbird's most famous public achievements was flying from New York to London in 1 hour 55 minutes as long ago as 1974.

If all this high-speed excitement has whetted your appetite for a few fast flights, and you don't fancy a trip in a Lightning at Thunder City (www.thundercity.com) in Cape Town, South Africa, you need look no further than your PC, your copy of FS2002 and a couple of websites. At this point it's probably worth mentioning that the definitive flight simulator for all things supersonic and space-age is X-Plane; the flight models can be easily manipulated, and you can quite happily flit around in an SR-71 at 80,000 feet or rocket skywards to Mach 2 in a Lightning.

There are currently two Lightning models available for FS2002 (tell us if you know different!) and

they both have to be paid for. The first we looked at was from Alpha Simulations (www.alphasim.co.uk), who have three different Lightning packs – The F.1A/F.3, the F.6 and T.5 (twin-seat) – all at £5.59 each. Download is straightforward once you've paid and received your password and installation is seamless. They work in FS2002 and CFS2, but as CFS2 versions have no weaponry you'll have to make do with intercepting the enemy and frightening them off.

Interestingly, the only 'kill' by a Lightning was an RAF Harrier that had gone out of control. The pilot had ejected and it was shot down by a Lightning to prevent it crashing on a populated area. Overall, the Alpha Lightnings are reasonably good value, although they don't include custom sounds. The cockpits aren't fantastic, but if you want to enjoy some simple supersonics, then look no further.

The TLUK panel had some strange textures on our PC

An ambitious Lightning project is underway at TLUK Aircraft Design (www.bac-f6.com). You can buy their Revolutionary Lightning package for FS2002 on CD (via www.simmarket.com) with 20 liveries, custom sounds, video footage of a Lightning on the runway at Bruntingthorpe and a manual for £24.99. To be honest, if we were reviewing this package in full we'd have a few moans about a missing undercarriage leg, strangely looping sounds, some odd textures around the cockpit and we'd also wonder whether permission was granted to reprint the pilot's notes. That said, the textures are better than on the Alpha version, and the flight model seems a touch more interesting. TLUK made it very clear to us that the version we looked at wasn't finished, but it is up for sale and so fair game for criticism. Updates for the package are underway, so if you fancy a comprehensive Lightning, albeit in an 'X-Plane style' (i.e. needing regular updates) then this is the one.

Getting the Blackbird flying is a little more complicated, and requires some tinkering. The only two SR-71s we could find were for FS2000, and so to get them flying in FS2002 you'll need to import them in the same way as we did with Concorde in the last issue; because they share a few common files you'll also need to have installed Concorde in FS2002 before you start.

Leaving RAF Valley in the TLUK F.3

The first SR-71 we came across can be found at www.simviation.com and is available as a free download of about 2.5Mb. It was put together by a team that included Blue Arrow's Mike Hambly and Graham Waterfield from PSS. We unzipped it into the aircraft folder easily enough, but the panel looks a little dated so we installed Francesco Mureno's re-working of Peter Pellionis' SR-71 panel (sr71_panel.zip) from the file library at the same site. The model is showing its age, as you'd expect, but still performs well in FS2002 and makes an interesting addition to your hangar.

Taming the metal firework

Just how do you go about reproducing the brute force and excitement of a Lightning in FS2002? We asked TLUK developer Daniel Dunn how he tackled the Lightning flight model. He told us: "The Lightning's flight model was a tremendously hard thing to sort out and it's still being tweaked. One of the main points that arose was the trade-off between either a flight model with the power to climb and fly at the high speeds the Lightning attained, or one that would behave properly, but without the range, speed, or true speed factors of the real one. The problem is that, because the Lightning has two engines, FS2002 decided that at the correct engine output the aircraft would be more powerful than a Saturn rocket! In the earlier beta release, models were zooming to 30-50,000ft and not wanting to come down. Very high speeds can still be reached in a dive with current models, but overall it flies slightly better and more like the real thing."

Daniel Dunn's Lightning shows off its reflective textures

Richard Barker's Blackbird at Edwards

The Thames estuary looks odd from 80,000 feet!

Francesco Mureno's re-modelled Blackbird panel

Another freeware Blackbird which uses the same panel is available, and this one was designed by Richard Barker. Again, it looks a bit dated but we preferred the textures on this model, although the wheels had a tendency to disappear into the tarmac – the sort of compromise that results from flying an FS2000 aircraft in FS2002. Fortunately this didn't affect the performance and we were soon frightening ourselves in this amazing aircraft.

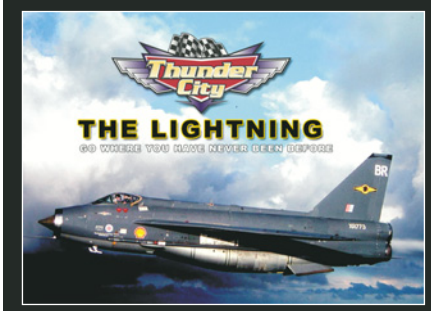
We weren't able to re-create the famous sub-two-hour Atlantic crossing, but flying over the UK at 80,000 feet is amazing, although VFR scenery looks very odd from this height. The real SR-71 can cover a mile in under two seconds, its fuselage heats up to 1,000° Celsius in flight and it holds a world airspeed record of 2193.2mph at 85,000 feet. The virtual version is pretty impressive as well, but we suspect that the flight model isn't as accurate as those of more familiar aircraft. Still, there's plenty of high-altitude fun to be had if practising approaches in a Cessna has left you a little jaded.

Many of you seem particularly interested in supersonic flight, as it represents one of the more exotic aspects of aviation, and one of the best things about flight simulation is that it brings the exotic within everyone's reach.

While it's possible to fly these amazing aircraft in the virtual skies, it's clear that if a commercial publisher were to bring out a supersonic flight package it would sell like cakes that had been left on the fuselage of an SR-71 in flight. ■

Derek Smalls

Go supersonic... if the price is right!



Thunder City is supported by Shell Aviation and operates two airworthy Lightnings from their base at Cape Town in South Africa. A 40-minute flight in one of these beautiful aircraft is yours for about £6,000. If your budget is tighter, you can always take a trip in a Buccaneer for about £4,000 or a Hunter for a measly £2,300. To find out more visit **www.thundercity.com**

Parallel Tracks

Why do so many pilots love flight simulation?

Harsh reality...

The PA-28 is the mainstay for the typical experienced PPL

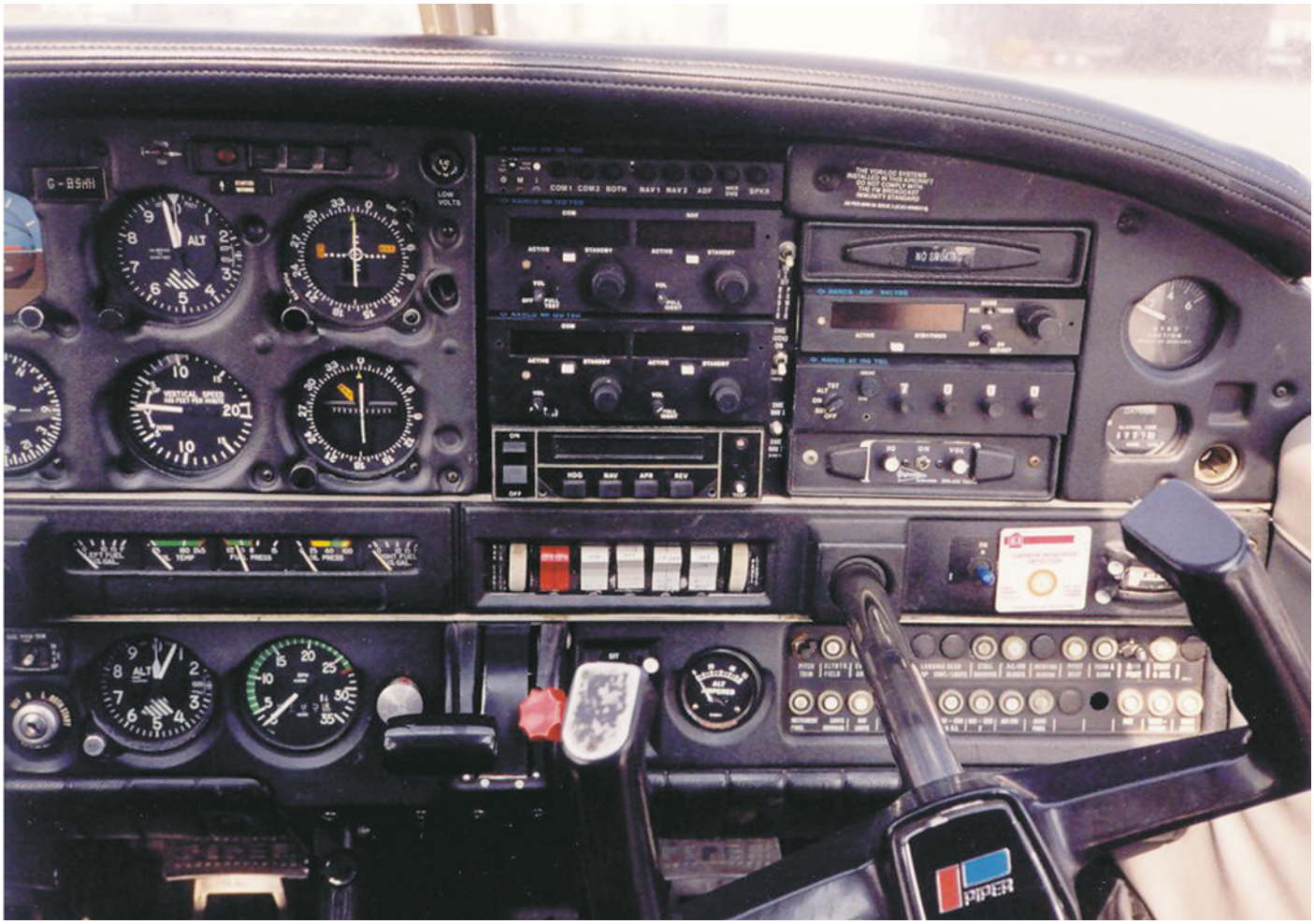
The alarm goes off at 06:00 Zulu (GMT). You crawl out of bed and walk bleary-eyed to the window for your first look at the day's weather. It's still dark, but the pattern of rings in the puddles reflecting the streetlights is unmistakable: light drizzle which will mean poor visibility. Maybe it will pass; last night's television forecast said that the rain should clear overnight, but these things never seem to happen as fast as they predict.

The premium-rate aviation forecast call will be better, so you dial the number. Using as many abbreviations as possible, you scribble down the dictated 'Met', giving you your first reliable weather prediction for the day. As is often the case, the decision isn't easy because the forecast is marginal for your intended VFR flight. The plane is booked, however, and your passengers are keen, so you call to let them know that it's at least worth meeting at the airport.

You jump into the car; fortunately the traffic is light at the crack of dawn and, ever hopeful that it won't be a wasted journey, you drive the twenty-five miles to your local aerodrome. As you pull into the car park you can see the operations team already opening the hangar doors, and you remind yourself that the staff in some clubs aren't quite so punctual; then wander into the clubhouse and check that there's no problem with the plane booking, and that there are no snags with the aircraft that will keep you on the ground.

When you walk out to the plane, which is now parked on the apron, you check the fuel and the engine oil; both need attention, so it's back to the Ops room to order the fuel. This can take over an hour to arrive on a bad day, which is why you always check it as soon as you can. Topping up the oil is your task at this particular club. It's kept in a standard 40-gallon drum and pumped by hand into a jug to carry it to the plane. The hard part is that you have to top up the oil through the dipstick tube, which is about an inch in diameter, so you grab a funnel and add a quart of oil, cursing as the last few drops blow towards you in the breeze.

Your next task in the Ops room is to draw the track lines on your map for the flight from Exeter to Swansea. Flight planning takes a while, using the 'wiz-wheel' (a pilot's circular slide rule) to allow for wind and to perform all the other calculations. Off to the plane again to walk round and check everything else – oh yes, and to wait for the fuel. After another half hour the fuel truck trundles round the corner; fortunately you're the only person on the apron, and then it's back to the clubhouse for the final paperwork and to book out with ATC by phone, before walking out to the aircraft



Unusually comprehensive electronics for a PPL rental plane. Spot the basic autopilot just above the switches

with your plans, maps, flight manuals, headsets and passengers. Getting into the venerable Cessna 172, you carry out the pre-start checks, and finally, shouting "Clear prop" out of the side window, start the engine. It's now 10:00 Zulu – some four hours since you opened those sleepy eyes.

Fortunately, the naturally aspirated Cessna engine started easily. A fuel-injected engine that's hot from a previous flight can be a devil to start, seemingly requiring either three hands or well-practised reactions. With the engine ticking over, and the temperature needle slowly rising up into the green arc, you carry out the after-start checks line by line, tune the radios and call for taxi clearance.

There are more critical checks to do both during taxiing and at the holding point wigwags, including some that are so important that they are often called 'vital actions'. Time to call "Golf Mike Hotel, ready for departure," and receive the reply "Golf Mike Hotel, cleared for take-off, right turn out, surface wind two eight zero at one five knots." There's a brisk breeze from the right, so you'll need to hold some into-wind aileron throughout the ground roll to stop the wind lifting the wing during your take-off run.

Holding the plane straight down the runway centreline is easy, and a medium-strength pull on the yoke unsticks the wheels. Your immediate actions are to use the rudder to nail the slip indicator ball in the middle and to hold the climb attitude. You also turn slightly right to keep the plane on the extended runway centreline; it's considered very unprofessional to drift offline during the initial climbout. At 200 feet above airport elevation you check the Ts and Ps (temperatures and pressures), and at 500 feet turn ninety degrees right, continuing up to 1,000 feet before turning onto your planned heading towards Minehead.

Shortly afterwards, Exeter Tower transfers you to their Approach frequency, where you are given the Portland and Wessex regional QNHs. You set up the cruise at 2,500 feet using the Portland QNH and, once trimmed, the plane holds altitude almost as if on autopilot.

The trimming for level flight is done in three stages. First, hold the yoke steady in the position that will maintain the plane's altitude; you will have to resist the forces trying to move the yoke (the control forces). Next, hold the yoke in the same position and turn the trim wheel until the control forces disappear. Finally, relax your grip on the yoke to prove that the plane is properly trimmed. You do not move the yoke whilst trimming the aircraft. When the plane is in trim, you can let go of the yoke without it moving, and only need to give it small nudges to keep the plane flying straight and level.

Following your map, you check your drift as you pass Tiverton, and at the halfway point to Minehead make the appropriate heading correction for the second half of this leg. You then request frequency change to Cardiff Approach, deciding not to bother with London Information's FIS (Flight Information Service), as the two airports' ATC can give you a LARS (Lower Airspace Radar Service) for your whole journey. You report your position, route, heading, altitude, conditions (VFR), estimated arrival time for Minehead, and request traffic information. Finally, you request permission to enter their airspace at Nash South and then route directly to Porthcawl.

They clear this and ask you to report at Nash South. Checking between the map and the outside view, you continually confirm that you are on target for Minehead. Whilst you know that the view and the map should match, it can be difficult to work out exactly what you are looking at out of the window. To make it easier, you turn the map so that it is oriented the same way as the ground you are flying over. This helps, but navigating over the relatively barren landscape that has few distinguishing landmarks is still tricky.

Typical UK weather – not much to see outside except the wing

On reaching Minehead, you turn for the Nash Point VRP (Visual Reference Point) and set the Wessex regional QNH, then at Nash Point South you call ATC. They tell you to report leaving the control area at M4 Junction 36, and give you their aerodrome QNH, which you set on your altimeter. You check your map and find that this VRP is the motorway service station just north of Bridgend, which is pretty easy to spot.

As you cross the Cardiff airspace, the weather to the west looks significantly worse than the original forecast had suggested, so you ask Cardiff for the Swansea weather. The news isn't good; the cloud base there is only 400 feet, which is below your legal limits, and so the only options are to divert or to turn round and return to Exeter. You decide to divert to Cardiff, as you are only about ten miles away.

You inform Cardiff Approach and request joining instructions. They route you to the St Hilary TV mast, which is easy to spot but, paradoxically, an Air Navigation Obstacle. They also tell you which runway is in use and the QFE. Soon after the VRP you are transferred to the tower, and report "Right downwind three zero to land". Complete your downwind checks and you're "cleared to finals number two following PA-28 on short finals".

When you have rolled out of your turn onto base leg, you reduce airspeed into the white arc and lower the first stage of flaps. Turn onto finals and see the Piper Cherokee exiting the runway, making you 'number one'. Calling "finals", ATC responds with your landing clearance, including the surface wind speed and direction. A quick check confirms that you are inside crosswind limits, and you lower the rest of your flaps one stage at a time. As the flaps deploy and the lift increases, you subconsciously pitch the nose down slightly to compensate. Consequently you have a perfect view of the runway right until the very last stages of your flare and touchdown. A few gusts down the final approach rock the wings and pitch the plane slightly; nevertheless, the aircraft remains extremely stable and easy to control. The landing is, of course, perfect, without even a chirp from the tyres. Your passengers are impressed.

Tricky navigation in poor conditions, but it would be pure fun in a simulator

You taxi to the GA parking, shut down, and head for the cafeteria via the briefing room. With the new met forecast in your hand, you look gloomily at the synopsis and TAFs. The low cloud that is now at Swansea is likely to reach Exeter before you arrive there. Your only option is to wait until the predicted warm front has passed, which is expected to be about two hours later. You phone your club to let them know that you are stuck on the ground, but the staff understand the weather; they are actually pleased that you are safe on the ground, and not trying to return in murky weather that you have not been trained for – press-on-itis is a killer. This is bad news for the next person hiring the plane, but she too understands and happily accepts the situation.

At 14:00 Zulu the cloud has lifted sufficiently for you to risk checking out the plane for the flight back to Exeter. Everything is OK, so you re-check the Met and modify your plan for the trip back from Cardiff. You phone the tower to book out, giving them your call sign, aircraft type, number of persons on board, destination, flight duration and the hours of fuel endurance in your tanks. All set, you walk to the plane, make a final visual double-check of the fuel in the tanks and strap everyone in.

After engine start you call for taxi and then departure clearance before finally entering the runway for take-off. The unfailingly helpful ATC clears you directly to Minehead, and the rest of the journey backtracks your morning's flight. Halfway over Exmoor you request frequency change to Exeter Approach and tell them that you intend to land there. They ask you to "report field in sight", which you do with about five miles to go. From there it's an easy join on right base for 26, stopping easily for the exit halfway along the runway.

By the time you've taxied to the hangar, the engine temperatures will have evened out, and all that remains to do is follow the shutdown procedure with its key checks and then put the plane to bed. After completing a few more items of paperwork, handing over a couple of hundred pounds, and filling in your logbook, you are ready for the drive home. At 16:00 Zulu you turn the front door key, reflecting on an interesting day's flying.

...and the satisfaction of simulation

The sun breaks in through a gap in your curtains and its rays fall mercilessly upon your eyes. You peer at the still silent alarm clock, note that it is 08:10 Zulu, and think about getting up. Gathering your thoughts, you enjoy a leisurely breakfast while surveying a map and pondering possible flights. Fed and watered, you get down to some flight planning, which will be no different to that for a real flight.

Preferring something a little more challenging today, you decide that you'll set the wind, cloud and visibility to give you the murky weather that is on the boundary between VFR and IFR flying. You have every intention of completing the flight and solving any problems along the way, even if it means running the risk of having to change to instrument flight at some stage. You haven't spent around £10,000 to get an instrument rating, but that doesn't matter, as you are well practised in the skills. Furthermore, you know that there's no possibility of a hefty fine if you stray into the wrong airspace, and the worst accident you are likely to have is spilt coffee. The marginal conditions selected are perfect for testing your ability, not to mention keeping the spice in your flying.

Your next decision is which plane to fly today; the range of aircraft in your virtual hangar will be enormously greater than any real-world pilot could ever dream of, and they are all there for your personal pleasure. You're being sensible today and resisting the temptation to fly a visual cross-country flight in a 747; you plump for the Beech Baron twin – a plane with a good turn of speed, but quite manageable for flight under VFR.

You may think it's a small plane, but for most PPLs, it's about as big as it gets

Your whole fleet cost about £50.00, which is buttons compared to a thirty-year-old Baron that could set you back £100,000. The alternative rental would be around £250.00 per hour, which is cheap compared to renting a King Air, which would cost you a king's ransom of almost £900.00 per hour.

The choice gets even wider when deciding on a departure and destination aerodrome. You don't have to stick to the few bases that are within driving range, but can choose anywhere from Aberdeen to Exeter, or even Aalborg to Zweibrucken; you don't even have to plan a route that will bring you home again. You can fly to wherever you wish and abandon the plane there, secure in the knowledge that it will always be back in the hangar ready for your next flight. Not only that, but you could choose to fly your Sopwith Camel from Heathrow if you want to – there are absolutely no restrictions.

Tracking parallel to the railway on the way to Norwich

Time to do the planning. You decide to use a PC-based planner; after all, you're sitting in a comfortable chair at your PC, which is more than capable of doing all the necessary sums. With the flight log sheet spooled from the printer you start up the simulator and select the aeroplane, weather, time and start point. You are then magically transferred into the cockpit on a gloomy, rainy day, without a single drop of rain touching your shirt – and it's still only 09:30 Zulu.

The engines are already running and you know that they are pretty reliable because that's how you have set up the simulator. Nevertheless you carry out some pre-flight checks for good measure. You'll be flying visually, so there's no need to set anything on the radio, but you set the bug for your initial heading and put the cruising altitude on your autopilot. After a quick call to ATC for taxi clearance, you set off for the holding point. Keeping the plane in a straight line in the wind is tricky, and is the first sign of the lack of proper stability displayed by many virtual planes.

Once you have found your way to the holding point, you call for departure clearance and you're off. Holding the plane straight along the runway centreline initially has you tap dancing on the rudder pedals, but this gets easier as the speed increases. Pulling back on the joystick, you rotate and allow the speed to build until it's above the blue line speed. The plane climbs enthusiastically, and there's very little time to clean up the flaps and retract the undercarriage before your right turn out 500 feet above the airfield.

Flying this high-performance aircraft means things happen quickly, and you have to be much slicker at getting everything done. It takes very little time to reach your low cruising level just below the clouds. The plane has shown an ever-present twitchiness in pitch, but once in the cruise you have the option of either trimming the plane or using the autopilot to give you a hand. Most joysticks are sprung to a fixed centre point and therefore cannot directly mimic the real procedure of trimming. Consequently you must move both the trim and the joystick at the same time until the joystick can be released in the centre position – neither easy nor quick, but worth doing.

Showing off is risk-free in the virtual world

During the climbout, ATC called you with "Frequency change approved", so you opt for the 'flight following' option. Now comes the task of navigation. At three miles per minute you have very little time to spot ground features, and in simulated flying there is always doubt whether the ground features you are looking for have been accurately modelled. There are roads but, just as in real aviation, only the major dual carriageways are of any use. There are no railways in the area of your flight, so there is no difference to the real thing in this respect either.

This lack of authentic ground features would be more apparent in populated areas, but the skill of navigation is the same whether the landscape is real or virtual; at two or three miles per minute it can be difficult to spot the important features in either case, especially in poor visibility. Cruising on towards Devon's north coast, you see the one big and clear feature on the route, a large unmistakable lake three quarters of the way to Minehead. The stopwatch tells you that you had better start concentrating on identifying Minehead, but ATC interrupts your thoughts and tells you to change to Portland Approach. This is one of the unwritten 'laws' of aviation: whenever you urgently need to do something, there is always something else that also has to be done at the same time.

Coasts are great navigational aids, because they are unmistakable; as long as you are not in cloud, you know exactly when you have reached the coast. This means that you can spot the location of Minehead reasonably easily – just to the east of a hilly promontory. As you are flying a twin, virtual drowning is unlikely even in the event of an engine failure; so, a quick check of your fuel status and you can set your planned heading direct to Swansea, thus avoiding the dogleg that many pilots would take in a single-engined aircraft in order to reduce their time over water.

As you approach Swansea, the local weather you have planned there kicks in, reducing the cloud base to 1,100 feet above the airfield. You set the NDB and DME frequencies and identify them one at a time by pressing the buttons on your audio panel. The NDB is clearly audible, but the DME cannot be heard, so you'll have to fly the Runway 22 NDB DME without the DME. The approach plate allows for this with a slightly different flight profile; you still cross the NDB at 2,500 feet, and descend outbound to 2,050 feet on the 043 radial. Instead of turning left at DME 5.5 miles, however, you turn after two minutes to

Tiverton – it should be here, according to the map!

intercept the 208 radial inbound, then descend to an MDA (Minimum Descent Altitude) of 1,300 feet.

This is pretty high for an MDA, but the final approach track is 13 degrees off the runway heading, meaning that you will have to jink across to the runway centreline as soon as you become visual. Any less than 1,300 feet and you would probably be too close to the runway to land. Nevertheless, you should ultimately pop out of the cloud just inside your limits. You cancel the flight following and call Swansea. You can't let them know that you will be flying an IFR approach, so the radio calls must be made as if still in VFR. The approach is tricky in the Baron, primarily because the lack of stability makes its presence felt again during the busy approach.

When you do break cloud, you see the runway is offset to your left and you are glad that you descended fairly smartly after completion of your turn inbound. Had you delayed it, you might have needed to fly a circuit to land or fly the missed-approach procedure.

As you decelerate to your final approach speed, the glorious view of the runway disappears behind the panel, so you raise your seat a notch or two to regain the realism. The visual cues are easily sufficient for you hold off just enough to 'grease' the landing. You taxi to the apron and take a short break to make a cup of coffee.

Back at the PC you are ready for your return flight, but you decide that it would be far more enjoyable to try your hand at full-blown VFR navigation from Cambridge to Norwich, via Bury St Edmunds and Diss. The new VFR Photographic Scenery means that the virtual scenery is exactly the same as the real thing, and you change back to a Cessna 172 so that you have more time to spot and admire the features passing by on the ground.

Despite this, as you fly over the landscape the extra detail doesn't seem to help much; there is just so much to see that doesn't appear on aviation maps, such as trees, fields, villages and numerous roads. It almost seems a distraction from the task in hand, and you have to force yourself to fly your planned headings and times. You are obviously doing something right, because the waypoints appear when expected.

The last run into Norwich is largely alongside a railway line, making that part easy. All you do is fly slightly right of the track and keep an eye on it out of your left window. As you approach Norwich, you decide not to call their ATC immediately, but to take a detour due east and buzz your mate's house in Fleggburgh near the Norfolk Broads. Yes – even villages so small that you can't find them on any aviation map are there.

After a loop or two, you return towards Norwich and declare your landing intentions. You are cleared to join left base for 27 and then to land. It's now approaching midday, so the choice becomes a tricky one – do you fly again, perhaps in a heavy jet this time, or do you wash the car? A tricky choice, but then there's no charge for another flight... and the car isn't really that dirty yet, honest. ■

Stephen Heyworth

COMPETITION *Win a piece of Eastern Front history!*

We've managed to get hold of five very special copies of the Operation Barbarossa mission and campaign expansion for IL-2 Sturmovik. The manuals that come with these copies have been personally signed by 1st Lt. Ernst Scheufele, the legendary Luftwaffe ace whose photo graces the manual.

Just answer these three questions correctly for a chance to win.

1) Operation Barbarossa refers to the invasion of:
a) Russia
b) Finland
c) Hungary

2) Operation Barbarossa began in:
a) 1943
b) 1942
c) 1941

3) The name Barbarossa refers to a German:
a) King
b) Emperor
c) General

This competition is open to PC Pilot readers anywhere in the world, apart from PC Pilot staff, who'll just have to make do with their own unsigned copies. Send us your answers by e-mail to comps@pcpilot.ne tor on a postcard or the back of an envelope to:

Operation Barbarossa Competition, PC Pilot, PO Box 11, St. Ives, PE27 3GW, UK

Please remember to include your full name, address and e-mail address (if you have one) with your answers. The competition closes on 31 March 2003, and the winning entries will be drawn totally at random from all the correct answers we receive.

Flight Sim Training

Professional instruction with Bill Stack

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Today's flight

Our planned destination this time is Copenhagen, Denmark, but we will not land there after all. Weather that was good enough for landing there at the time of departure will deteriorate en route, and we'll be forced to fly to an alternate airport.

We've mentioned previously the rule requiring every instrument flight to include an alternate airport, in case landing at the primary destination is impossible, but we have not faced the need until now. During this flight we'll see exactly why this rule exists, and why we must carry enough fuel to reach an alternate airport.

Instrument pilots know that using an alternate might be necessary, especially when weather reports for their prime destination are marginal and/or deteriorating, but they don't know for certain if the alternate will be required until they are nearly at the chosen destination airport. As simulation pilots, we will know in advance, and so can establish weather conditions that will require the change in destination.

The distance between Hamburg, Germany and Copenhagen is about 155 miles, and the flight will last about an hour, depending on your airspeed. The distance between Copenhagen and the alternate airport, in Malmo in Sweden, is about 30 miles, and this flight will last between 20 and 30 minutes.

Departure

We'll start our flight at Hamburg International airport (EDDH), where we landed in our last tutorial. (Its website is www.ham.airport.de.) Of the four criss-crossing runways, 33 will be ideal in today's northwesterly wind. An easy-to-follow SID (Standard Instrument Departure) procedure will lead us from EDDH towards Copenhagen.

Destination

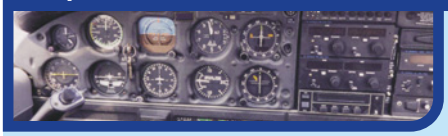
Copenhagen's Kastrup (EKCH) is a busy commercial airport with six runways, ranging in length from 7,759 feet (2,366m) to 10,827 feet (3,302m). Its website is www.cph.dk.

Our alternate airport will be Sturup (ESMS) in Malmo, Sweden. Although this airport has only one runway, it handles many commercial passenger flights. A photo on its website (www.sturup.com) shows several large commercial jet airliners parked at its terminal gates.

Our route

Although several IFR routes pass over Hamburg, none goes over Copenhagen; consequently our course between these cities will not be direct. We will fly to Conan VOR, which is the IAF (Initial Approach Fix) for EKCH, then we will join the IAP (Instrument Approach Procedure).

Setup data



Like any professional IFR pilot preparing a flight, you'll need to get your simulator and aircraft ready. Select your aircraft, establish your weather, set the date and time, and file your flight plan according to the information in our setup data. Spending a few minutes on these preparations will make your flight realistic, challenging and enjoyable.

Select your aircraft

Fly with us in our Mooney Bravo IFR version. A good alternative would be the Cessna 182RG; it's a similar four-seater, but a little slower.

Establish today's weather

The following settings will give you realistic conditions for a typical winter instrument flight in northern Europe. Additionally, we need to establish poor conditions at EKCH to force the use of our alternate airport.

These settings would usually serve as our weather briefings, but no sensible pilot would plan a primary destination where he knew weather was below minimums. For the purpose of this tutorial, therefore, we will pretend that the weather at EKCH is the same as our global weather upon departure, and that it deteriorated during our flight. After all, we are simulating a flight that forces us to use an alternate airport.

Global Weather

Clouds 1,500 to 3,000 MSL: 7/8 stratus

Clouds 5,000 to 8,000 MSL: 6/8 cumulus

Precipitation: None

Wind up to 5,000 MSL:
16 knots from 330 degrees

Wind up to 10,000 MSL:
20 knots from 340 degrees

Wind up to 15,000 MSL:
25 knots from 350 degrees

Temperature, dew point at 5,000 MSL:
20°F/-07°C, 15°F/-09°C

Temperature, dew point at 10,000 MSL:
05°F/-15°C, -06°F/-21°C

Temperature, dew point at 15,000 MSL:
-24°F/-31°C, -34°F/-37°C

Pressure: 30.01 inches, 1016 millibars

Visibility: 10 miles, 16 kilometres

Copenhagen, Denmark (EKCH)

Clouds 1,000 to 3,000 MSL: Overcast stratus

Clouds 3,000 to 8,000 MSL: 5/8 cumulus

Precipitation: Moderate snow

Wind up to 5,000 MSL:
15 knots from 300 degrees

Wind up to 10,000 MSL:
20 knots from 310 degrees

Temperature, dew point up to 5,000 MSL:
15°F/-09°C, 15°F/-09°C

Temperature, dew point up to 10,000 MSL:
0°F/-18°C, 0°F/-18°C

Pressure: 29.88 inches, 1012 millibars

Visibility: 0.25 nautical miles, 0.5 kilometres

Set date and time

Set the date for any day during winter, and set the time as you prefer – day, night, dusk or dawn.

Tune your radios

Set your Nav-1 and Nav-2 radios and your OBI for the first frequencies and radials you will use.

Com-1: 121.8 (Hamburg Ground Control)

Com-2: not needed

Nav-1 Primary: 110.6 (LUBECK LUB)

Nav-1 Standby: 113.5 (GEDSER GES)

Nav-2 Primary: 115.8 (ALSTER ALF)

Nav-2 Standby: 110.6 (LUBECK LUB)

OBI-1: 066/246

OBI-2: 333/153

ADF: 323 (Hamburg GT)

Buy fuel

Buy sufficient fuel to meet IFR requirements – enough to reach the primary destination and enough to reach an alternate airport, plus enough to remain airborne for another 45 minutes. Our calculation is between 30 and 40 gallons.

Study your charts

As usual, a brief review of our flight charts shows how we will get to our destination safely under normal conditions. Knowing our route before we start will prepare us for anything that might happen en route.

Departure

An established departure procedure with routes and minimums for runway 33 at Hamburg (EDDH) is readily available in SimCharts – LUBECK 4X Departures (X being B, C, D, G or H).

Don't let all those courses on the SID intimidate you. They show five procedures for four runways (one of the four runways has two procedures). Because you will take off from only one runway, you need to pay attention only to that procedure, which is Lubek 4G for runway 33. Similarly, only some of the textual guidelines apply to you, so disregard the others. Don't bother trying to understand requirements that don't apply to you. Once you have your route and instructions identified, the chart isn't as difficult as it might first appear.

Be sure to read all the relevant notations on the chart, and to follow instructions that do apply to you; the text requires, for example, "strict adherence within the limits performance criteria" for all aircraft because of noise considerations.

The SID shows two right turns after taking off. The first is a 62-degree right turn 4.5 miles from ALF, and the second a 31-degree right turn when intersecting the 246 inbound radial of LUB. The chart clearly shows these simple turns.

After executing these two turns, we simply head to LUB, which is 25 miles from the point where we intercepted the 246 inbound radial, and maintain the 5,000-foot (1,525m) altitude above MSL. This VOR is the final fix on this SID and the beginning of our en route section.

En route

The en route chart needed for this flight is European SimCharts E(LO)5. At LUB we will turn left 19 degrees and head 047 along the G5 airway toward Gedser VOR (GES). Then we will climb to our 9,000-foot (2,745m) MSL cruising altitude.

Notice on the en route chart that there is no prescribed route from GES to CODAN VOR (CDA), which is the initial arrival fix for Copenhagen. We will break off the G5 airway and fly directly from GES to CDA.

At GES, we will turn left 14 degrees and head 033 to CODAN VOR (CDA). It is the final fix on our en route section and the beginning of our STAR (Standard Terminal Arrival Route) procedure for Copenhagen.

Arrival

At CDA we will turn left 18 degrees and head 015 towards KASTRUP VOR (KAS). The STAR we will us is CODAN 2D.

Notice on the chart that two arrival procedures are identified – 2B and 2D. The only stated difference regards the altitude at which KUBIS intersection is intercepted. Procedure 2B is for aircraft intercepting at FL100 (10,000 feet/3,050m) or below, and procedure 2D is for those intercepting at FL80 (8,000 feet/2,440m). A couple of oddities strike us right away: Firstly, any aircraft intercepting at FL80 or below is also entering at FL100 and below, and secondly, the chart does not explain different procedures for these aircraft. We will simply intercept KUBIS at our FL90 cruising altitude and take it from there.

Approach

The approach chart we will use is Copenhagen ILSDME Rwy 30. This calls for an entry altitude of 3,000 feet (915m), therefore we will descend from FL90 to 3,000 feet during the leg between KUBIS and KAS. We must be at 3,000 when, not after, we intercept it.

At KAS we will enter the IAP for Rwy 30 by turning right 117 degrees and heading 132 outbound. At D17 KAS, which is 17 miles from KAS, we will execute a 189-degree left turn and intercept the localiser. At D9.3 KAS, we will intercept the glideslope. From there, we will simply follow the localiser and glideslope normally to the runway.

Missed approach

The missed-approach procedure is very easy. If we cannot land, we simply climb straight ahead to 3,000 MSL to D9.0 KAS, and join a northwest holding pattern.

You can see from these charts that nothing about this flight is unusual or especially challenging, particularly for those of you who have been following these tutorials regularly.

Planning your flight

Based on these charts, lay out the course you will fly from EDDH to EKCH. Include the relevant navaids, intersections and fixes shown on the charts.

Use traditional paper charts and flight plans or an electronic flight planner. Paper charts and flight plans are still useful for seeing our course and estimated times at a glance. If you use the electronic flight planner, be sure to select 'IFR' so ATC will recognise your flight correctly.

Enter the following data on your flight plan:

Departure: Hamburg Germany (EDDH) Rwy 33

Arrival: Copenhagen Denmark (EKCH) Rwy 30

Waypoint: Hamburg NDB (GT)

Waypoint: Lubek VOR (LUB)

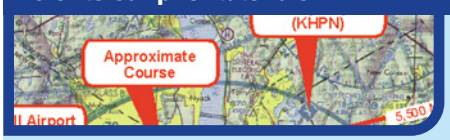
Waypoint: Gedser VOR (GES)

Waypoint: Codan VOR (CDA)

Waypoint: Kastrup VOR (KAS)

Altitude: 9,000 feet (2,135m) MSL

Refer to our prior tutorials



If you don't have our previous tutorials, they are all available either in back issues or on our 3-in-1 CDs. A complete list of the subjects covered in previous tutorials is included on the cover CD. For more details of back issues and the issues available on CD format, see our subscriptions page or the website, www.pcpilot.net.

Is there anything you would like to see covered in our tutorials? Let us know at mail@pcpilot.net and we'll look into it.

IFR (Instrument Flight Rules) Tutorial Part 21 Going, Going, Gone Elsewhere

Using an alternate airport

After you have prepared your aircraft and your cockpit for this flight, contact the Hamburg tower for take-off clearances. Follow instructions from ATC, including hand-offs and clearances. If the simulator you are using has no ATC, imagine that you have requested and received all required clearances.

Take off

Begin your take-off as soon as ATC clearance is received. In lieu of ATC, set your transponder for 5213, which is the setting we received from ATC.

Check your engine instruments during your take-off roll. The Bravo's manifold pressure should be at or above 38, and the oil pressure should be at least 24. The Bravo should lift off at about 60 to 65 knots. (Different characteristics apply to other aircraft.) If your aircraft isn't performing normally, abort your take-off.

During take-off and climbout you will have a helping headwind, so you should lift off sooner than normal and climb more easily. Turn off your taxi light after taking off. You may turn off your strobe when you are in clouds.

Adjust your pitch to maintain about 85 knots during your climbout. As you are climbing, adjust your cowl flap to keep your engine temperature in the green range – neither too hot nor too cool. In this cold winter air, you might not need much cowl flap. After your initial climbout, your Bravo should be able to climb easily at 700 feet per minute at 120 knots. Retract your flaps when your airspeed reaches 90 knots.

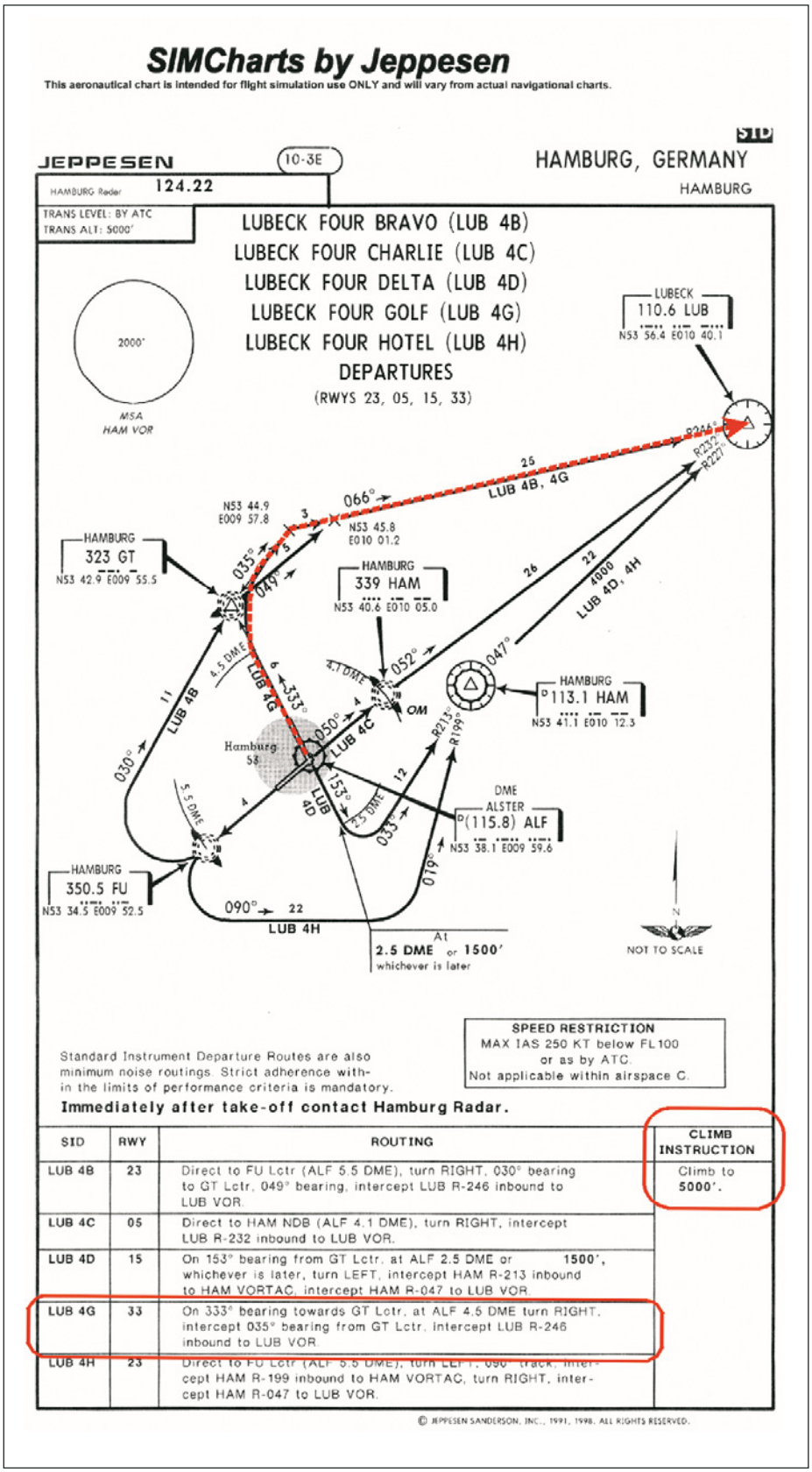
Icing is likely in the cold, wet temperatures prevalent during this flight, so be sure your de-icers and pitot heat are turned on.

Follow ATC's instructions, hand-offs and clearances throughout your flight.

Depart Hamburg

After taking off, follow the simple SID procedure for runway 33, which is LUB 4G.

Head straight out towards Hamburg NDB, and climb steadily towards the SID maximum altitude of 5,000 feet (1,525m) above MSL. An 80-knot indicated airspeed will give you a good climb rate for the initial climbout, and 100 knots will provide a good climb rate from 1,000 feet (305m)


SIMCharts by Jeppesen
This aeronautical chart is intended for flight simulation use ONLY and will vary from actual navigational charts.
JEPPESEN
10-3E
HAMBURG, GERMANY
HAMBURG
HAMBURG Radar 124.22
TRANS LEVEL: BY ATC
TRANS ALT: 5000'
LUBECK FOUR BRAVO (LUB 4B)
LUBECK FOUR CHARLIE (LUB 4C)
LUBECK FOUR DELTA (LUB 4D)
LUBECK FOUR GOLF (LUB 4G)
LUBECK FOUR HOTEL (LUB 4H)
DEPARTURES
(RWYS 23, 05, 15, 33)
2000'
MSA
HAM VOR
LUBECK
110.6 LUB
N53 56.4 E010 40.1
HAMBURG
323 GT
N53 42.9 E009 55.5
HAMBURG
339 HAM
N53 40.6 E010 05.0
HAMBURG
113.1 HAM
N53 41.1 E010 12.3
DME
ALSTER
(115.8) ALF
N53 38.1 E009 59.6
HAMBURG
350.5 FU
N53 34.5 E009 52.5
LUB 4B, 4G
LUB 4D, 4H
LUB 4B
LUB 4G
LUB 4C
LUB 4D
LUB 4H
066°
035°
049°
052°
047°
030°
333°
050°
153°
033°
019°
090°
N53 44.9 E009 57.8
N53 45.8 E010 01.2
Hamburg 53
2.5 DME or 1500' whichever is later
NOT TO SCALE
SPEED RESTRICTION
MAX IAS 250 KT below FL100 or as by ATC.
Not applicable within airspace C.
Standard Instrument Departure Routes are also minimum noise routings. Strict adherence within the limits of performance criteria is mandatory.
Immediately after take-off contact Hamburg Radar.
SID
RWY
ROUTING
CLIMB INSTRUCTION
LUB 4B
23
Direct to FU Lctr (ALF 5.5 DME), turn RIGHT, 030° bearing to GT Lctr, 049° bearing, intercept LUB R-246 inbound to LUB VOR.
Climb to 5000'.
LUB 4C
05
Direct to HAM NDB (ALF 4.1 DME), turn RIGHT, intercept LUB R-232 inbound to LUB VOR.
LUB 4D
15
On 153° bearing from GT Lctr, at ALF 2.5 DME or 1500', whichever is later, turn LEFT, intercept HAM R-213 inbound to HAM VORTAC, intercept HAM R-047 to LUB VOR.
LUB 4G
33
On 333° bearing towards GT Lctr, at ALF 4.5 DME turn RIGHT, intercept 035° bearing from GT Lctr, intercept LUB R-246 inbound to LUB VOR.
LUB 4H
23
Direct to FU Lctr (ALF 5.5 DME), turn LEFT, 090° track, intercept HAM R-199 inbound to HAM VORTAC, turn RIGHT, intercept HAM R-047 to LUB VOR.
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Hamburg SID - only LUB 4G for runway 33 is relevant to our departure

AGL (Above Ground Level) to 5,000 MSL. You should reach this altitude well before reaching your next fix. Adjust throttle to keep airspeed in the gauge's safe zone.

When you are 4.5 miles from ALSTER VOR (ALF) according to your DME, turn right 62 degrees and head 035.

On intercepting the 066/246 radial to LUBECK VOR (LUB), turn right 31 degrees and head 066 towards LUB along this radial. Adjust your heading as needed to stay aligned. This 25-mile leg will last about 11 or 12 minutes, depending on your airspeed.

Without DME at LUB, we must use time and speed for plotting our position on this leg, so jot down the time you entered it. We could use the DME at ALF to help determine our arrival at LUB. The chart shows the distance between these VORs as 30 miles, so the closer our DME from ALF gets to 30, the closer we are to LUB.

Today's northwesterly winds will be coming from our left and from behind, and will therefore push our aircraft forwards and towards the right. Alter your heading two or three degrees towards the left to compensate, and monitor your progress to be sure. Adjust heading as needed to stay on course.

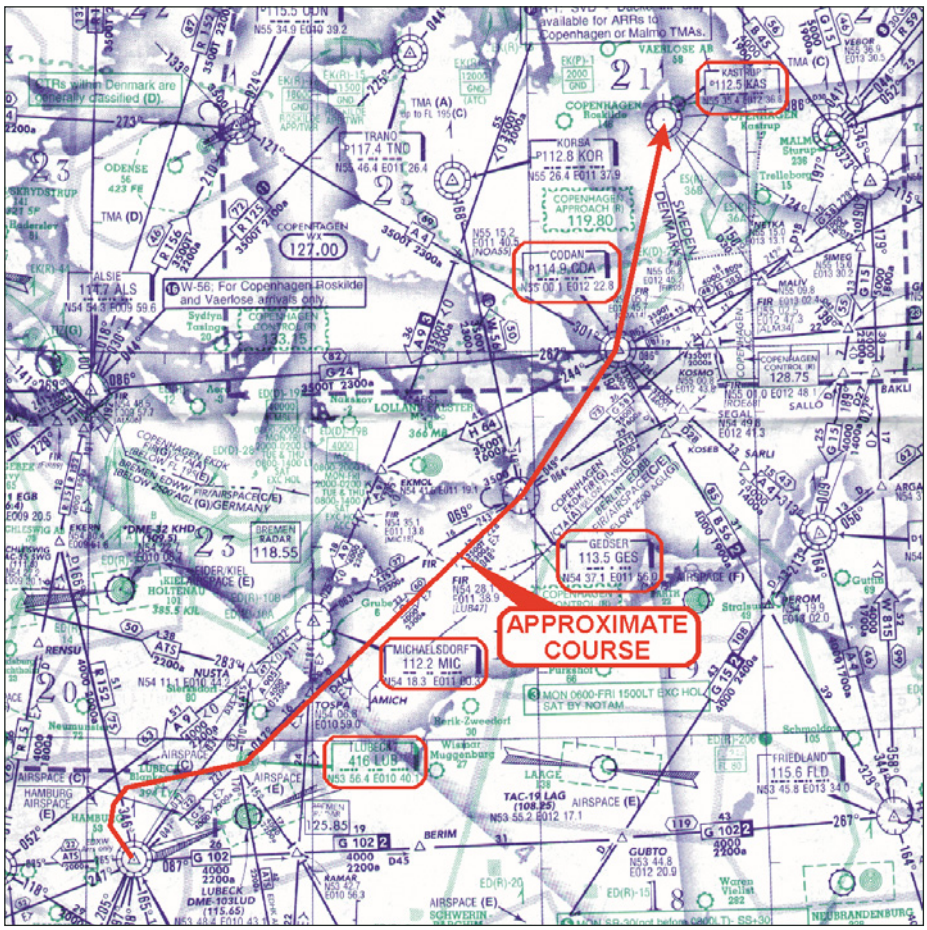
Fly en route towards Copenhagen

At LUB we will exit this SID and enter the en route section of our flight. Turn left 19 degrees and head 047 towards GEDSER VOR (GES). This route will be the G5 airway. The en route chart shows G5 to be 82 miles long – 22 miles from LUB VOR to LUB NDB, and 60 miles from LUB NDB to GES. The whole en route section will last about half an hour, depending on our airspeed.

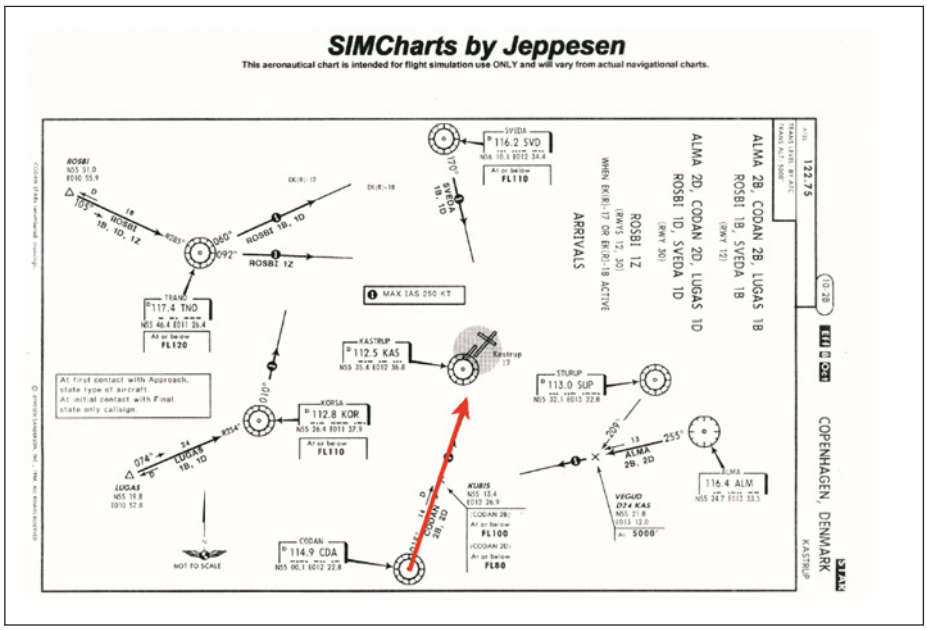
Having exited the SID, we can now climb to our 9,000-foot (2,745m) MSL cruising altitude. A 700-feet-per-minute climb rate will enable you to reach this altitude in a few minutes with the loss of only a little airspeed.

Switch your navigation radios to the frequencies you will need during this leg. Switch Nav-1 to GES (113.5), set your OBI-1 to 047/227, then track towards this VOR. Switch Nav-2 to LUB (110.6), set your OBI-2 to 047/227, and track from this VOR. Keeping both CDI (Course Deflection Indicator) needles centred will ensure that you are maintaining your course. Instead of continually correcting your heading, alter it a few degrees to compensate for wind.

Be sure to adjust your fuel/air mixture as you climb to cruising altitude. The higher your engine gets, the less oxygen it will have for combustion, so you will need to decrease the fuel portion of the mixture to compensate. This Bravo engine performs best when the TIT (Turbine Inlet Temperature) gauge reads between 1,500 and 1,700; adjust the mixture so the TIT is within this range. Do not exceed 1,750. These performance readings vary, of course, under differing atmospheric conditions, and they do not apply to other aircraft.



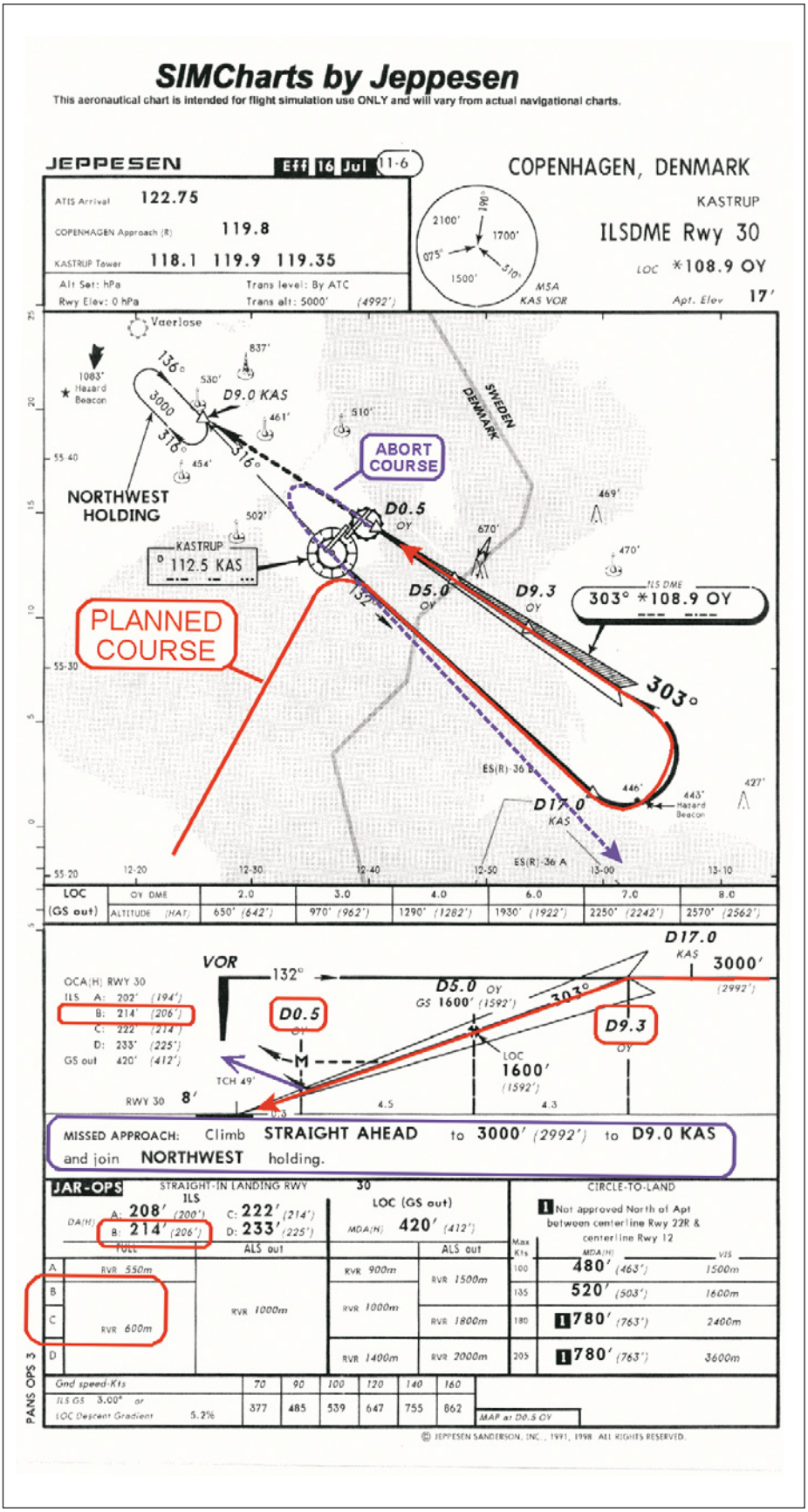
Our route from Hamburg to Copenhagen



The CODAN STAR for Copenhagen

Conserve fuel by changing the propeller pitch at higher altitudes. Our Bravo cruised easily at 170 knots indicated airspeed, and used 17 gallons of fuel per hour, with the following engine settings: RPM 2,100, manifold pressure 34, and TIT 1,600. If your engine is using fuel too fast, you could run out of fuel short of your destination. Adjust your settings until your airspeed and fuel-flow rates are optimised.

This leg will be rather boring, so do what you can to stay occupied and focused on your flight; en route boredom is typical in instrument flying, so learn to live with it.



The ILSDME for runway 30 at Copenhagen

A good way to maintain interest is to track your progress along the route and from one fix to another. The first fix will be LUB NDB, the next will be TOPSA intersection, then AMICH. Also, monitor your engine and aircraft instruments so you know how your aircraft is performing.

Without DME at GES or LUB, we must use other methods to determine position. Time, speed and heading are an old standby, so note the time you enter this leg. Triangulation from Michaelsdorf VOR is useful, too. Also, the more unstable the CDI on OBI-1 gets, the closer we are to GES.

Our halfway point is a good place to switch fuel tanks so that we will have nearly balanced tanks on arrival at our destination. This will make performing the prescribed turns much easier. The halfway point on this flight is somewhere near AMICH intersection.

This point is also a good place to set standbys for the upcoming radio navaids. Set Nav-1 standby to 114.9 for CDA, and Nav-2 standby to 113.5 for GES.

At GES, turn left 14 degrees and head 033 to CODAN VOR (CDA). Maintain your cruising altitude on the final leg of our en route flight. Swap your primary and standby frequencies for Nav-1 and Nav-2.

Nav-1 needs to be 114.9 for CDA, and Nav-2 113.5 for GES. Set OBI-1 to 033/213 and track to CDA. Set OBI-2 to 213/033 and track from GES. Keep both CDIs centred as you did during the previous leg. This 27-mile leg will last nine or ten minutes.

Join Copenhagen Arrival

At CDA, our en route section ends and our arrival for Copenhagen begins. Turn left 18 degrees and head 015 to KASTRUP VOR (KAS). This 36-mile leg should last about 12 to 15 minutes.

Change your navigation radios to the frequencies needed for this leg. Switch Nav-1 to KAS (112.5), OBI-1 to 015/195, then fly to KAS. Switch Nav-2 to CDA (114.9), OBI-2 to 015/195, then track from CDA. Keep both CDIs centred.

Begin your descent for the approach procedure about 20 miles from KAS or about 15 miles from CDA. Because the STAR doesn't prescribe an altitude, we will need to fall back on the IAP chart for guidance. Descend to the 3,000-foot MSL entry altitude shown on the IAP; a descent rate of 700 feet per minute should be adequate. Be sure to adjust throttle, propeller and mixture as necessary during your descent.

Reduce airspeed so you will arrive at KAS at 110 knots and can easily execute the next turn. Our current 015 heading and the 132 heading for the IAP differ by nearly a right angle. To avoid flying past KAS and executing a sharp right turn, begin turning towards the 132 course about a mile before reaching KAS. Adjust your course to align with the 132 outbound radial from KAS.

This 17-mile leg provides ample opportunity to prepare for our landing. Switch Nav-1 to the ILSDME (108.9). Switch Nav-2 to KAS (112.5), set OBI-2 on 132/312, and track from KAS. Reset your altimeter for local pressure. Switch to the fuller of your fuel tanks if you haven't done so already, and keep watch on your Nav-2 DME and your OBI-2 CDI, because they will tell you when you are at your next fix.

At D17.0, turn left about 100 degrees and head 030 on a sort of 'base leg'. Don't try the 189-degree continuous turn shown on this chart. With different aircraft types having

different turning radii, each would track this turn differently and exit at a different location. In our little Bravo, we would exit a 189-degree turn well short of the localiser beacon.

During this 'base leg', switch your DME button to Nav-1 so you can know your distance to the localiser. Keep close watch on your OBI-1 CDI; just as it starts moving inwards, turn left 90 degrees and intercept that localiser. Adjust heading as necessary to align the localiser, then follow it towards the runway.

At D9.3, you should intercept the glideslope. From here, follow the localiser and glideslope to Copenhagen's runway 30.

Abort the landing

Copenhagen's weather has deteriorated dangerously during the 45 minutes of our flight. Conditions on our arrival have fallen below published minimums, and we will not be able to land here as planned.

According to the IAP, the decision height for our Bravo is 214 feet MSL (206 AGL), and the RVR (Runway Visual Range) is 600 metres (1,830 feet). Our Bravo is a Class B aircraft, based on our approach airspeed of between 91 and 121 knots. Runway visual range is the distance we can see down the runway, and at 100 knots airspeed, we will travel the minimum RVR in ten seconds. This means that we and our aircraft would have only ten seconds to react to any obstruction we might see on the runway, and that's insufficient time for any human or aircraft.

Conditions are so poor at Copenhagen today that we cannot see the runway ahead of us when we are at 214 MSL, and we lack sufficient RVR for a safe landing. Consequently, we cannot land at this airport, and must fly to our planned alternate airport – Sturup in Malmo, Sweden.

To abort your landing, throttle up fully and raise pitch gently to stop the descent. You will level off briefly, then begin climbing. Adjust pitch as needed to climb out at 80 knots as though you were taking off normally. Retract your gear and flaps fully if you had lowered them for landing.

The missed-approach procedure calls for flying straight ahead to D9.0 and climbing to 3,000 MSL. Pilots would normally cancel landing intentions with ATC and fly to the alternate airport. Instead of flying to D9.0 and executing the holding pattern as shown on the chart, assume ATC clearance for the following procedure:

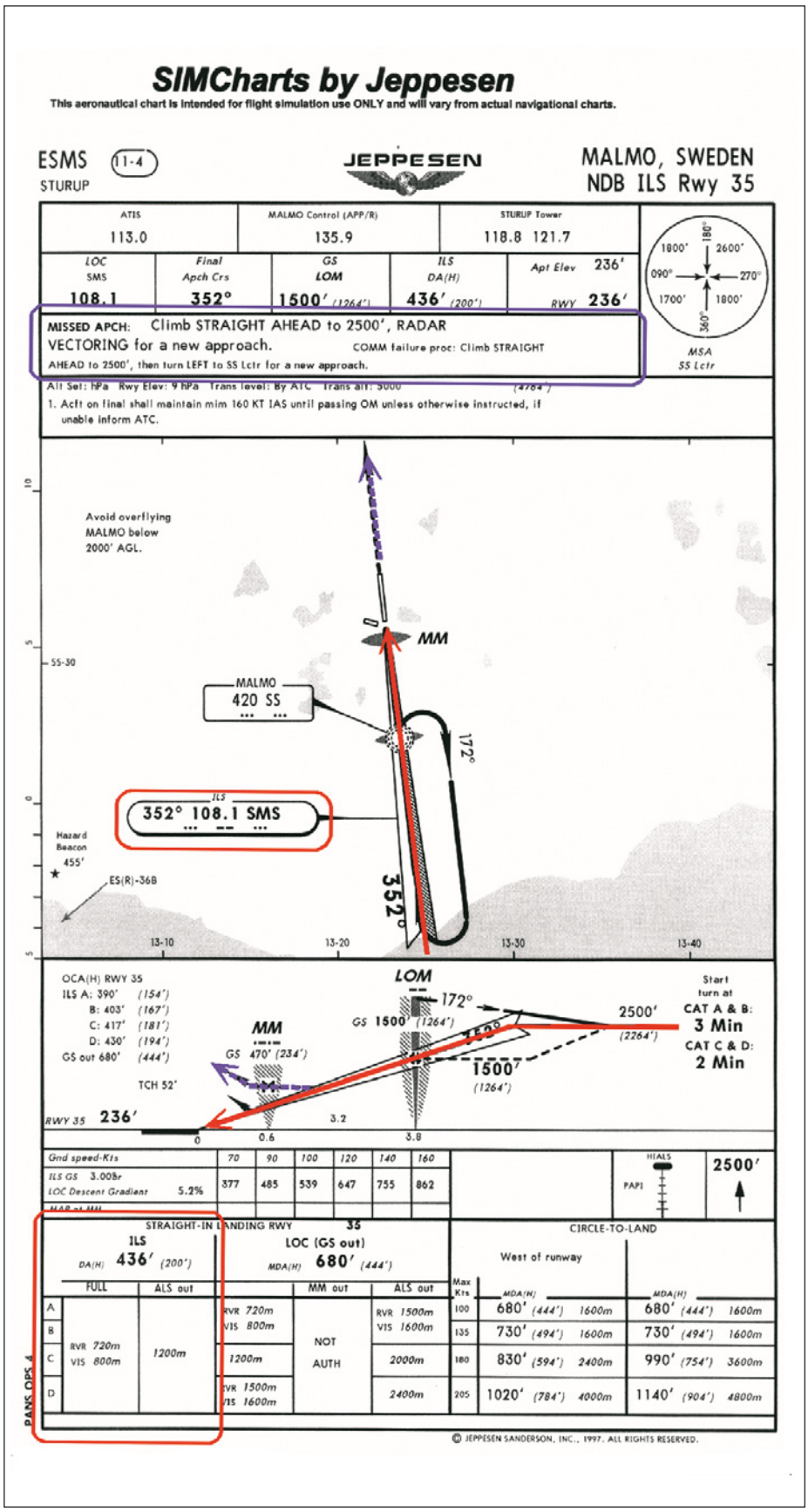
1) Fly straight out

2) Climb to 3,000 MSL

3) Level off and reduce throttle to maintain no more than 110 knots

4) Turn around at a standard rate

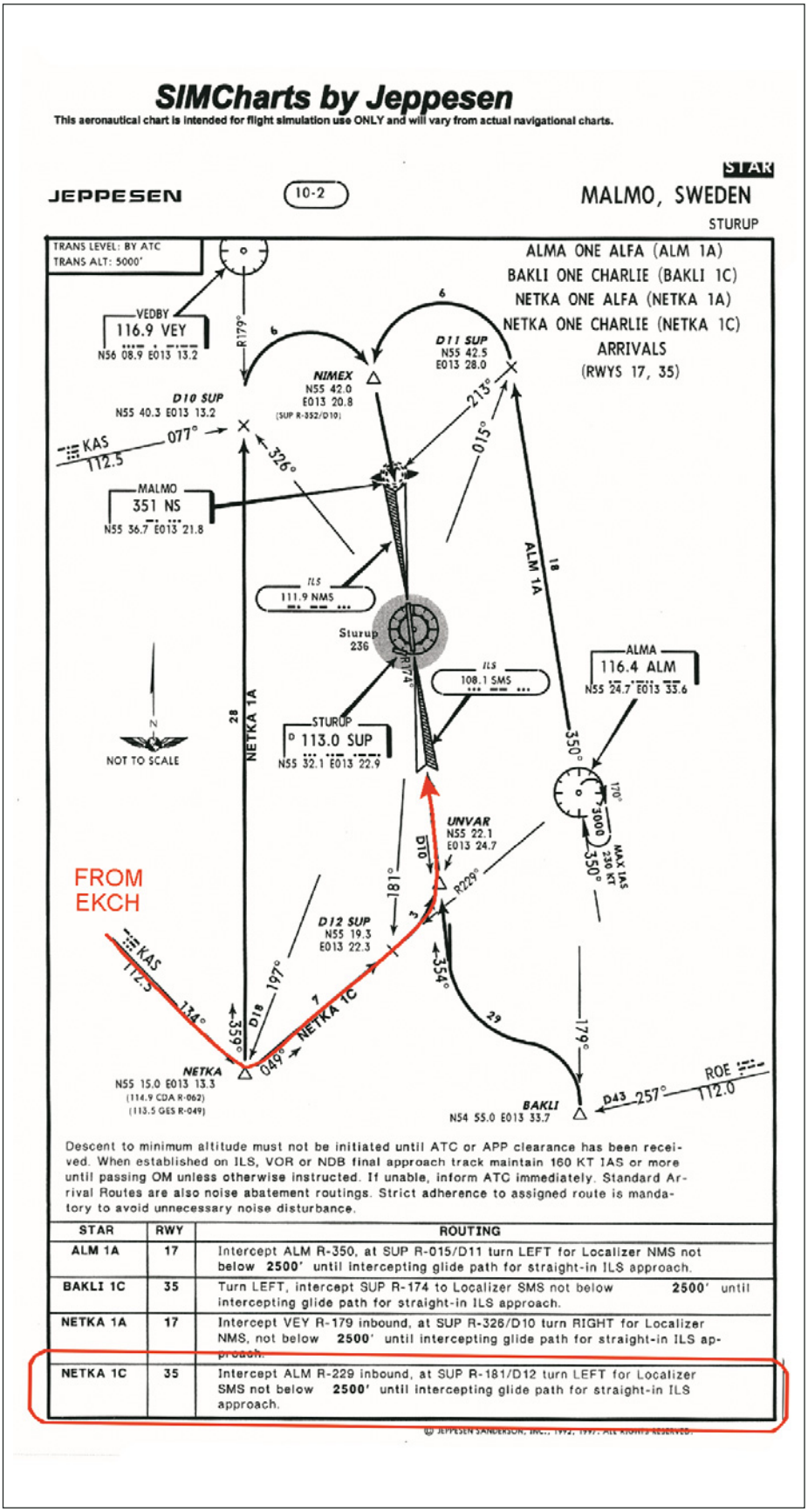
5) Head for KAS using Nav-2 for guidance



The NDB ILS for runway 35 at Malmo

6) Head 134 outbound from KAS towards Malmo

The flight to Malmo will last between 20 and 30 minutes, depending on your airspeed. If you like, you may accelerate to 140 or 150 between KAS and the next fix, which is about 19 miles away, but be sure to decelerate back to 110 so you can execute the turns easily. Maintaining our 3,000 MSL altitude will be all right on this short leg. Keep an eye on your fuel gauges, and switch to the other tank if necessary.


SIMCharts by Jeppesen
This aeronautical chart is intended for flight simulation use ONLY and will vary from actual navigational charts.
STAR
JEPPESEN
10-2
MALMO, SWEDEN
STURUP
TRANS LEVEL: BY ATC
TRANS ALT: 5000'
ALMA ONE ALFA (ALM 1A)
BAKLI ONE CHARLIE (BAKLI 1C)
NETKA ONE ALFA (NETKA 1A)
NETKA ONE CHARLIE (NETKA 1C)
ARRIVALS
(RWYS 17, 35)
VEDBY
116.9 VEY
N56 08.9 E013 13.2
NIMEX
N55 42.0
E013 20.8
D10 SUP
N55 40.3 E013 13.2
D11 SUP
N55 42.5
E013 28.0
KAS
112.5
MALMO
351 NS
N55 36.7 E013 21.8
ILS
111.9 NMS
Sturup
236
ALMA
116.4 ALM
N55 24.7 E013 33.6
ILS
108.1 SMS
STURUP
D 113.0 SUP
N55 32.1 E013 22.9
NOT TO SCALE
NETKA 1A
ALM 1A
UNVAR
N55 22.1
E013 24.7
MAX IAS
230 KT
FROM
EKCH
D12 SUP
N55 19.3
E013 22.3
NETKA 1C
NETKA
N55 15.0 E013 13.3
(114.9 CDA R-062)
(113.5 GES R-049)
BAKLI
N54 55.0 E013 33.7
ROE
112.0
Descent to minimum altitude must not be initiated until ATC or APP clearance has been received. When established on ILS, VOR or NDB final approach track maintain 160 KT IAS or more until passing OM unless otherwise instructed. If unable, inform ATC immediately. Standard Arrival Routes are also noise abatement routings. Strict adherence to assigned route is mandatory to avoid unnecessary noise disturbance.
STAR | RWY | ROUTING
ALM 1A | 17 | Intercept ALM R-350, at SUP R-015/D11 turn LEFT for Localizer NMS not below 2500' until intercepting glide path for straight-in ILS approach.
BAKLI 1C | 35 | Turn LEFT, intercept SUP R-174 to Localizer SMS not below 2500' until intercepting glide path for straight-in ILS approach.
NETKA 1A | 17 | Intercept VEY R-179 inbound, at SUP R-326/D10 turn RIGHT for Localizer NMS, not below 2500' until intercepting glide path for straight-in ILS approach.
NETKA 1C | 35 | Intercept ALM R-229 inbound, at SUP R-181/D12 turn LEFT for Localizer SMS not below 2500' until intercepting glide path for straight-in ILS approach.

The NETKA 1C STAR for Malmo

Arrive at Malmo

The STAR for Malmo's runway 35 begins at a fix named NETKA. This fix is on the 134 radial from KAS, but the STAR doesn't show how far NETKA is from KAS. We clocked it at 29 miles, so this leg will last between about 12 and 15 minutes, depending on your airspeed. To determine our arrival at this fix, we must triangulate with another VOR; either STURUP (SUP) or ALMA (ALM) will do. When we intercept SUP's 197 radial and/or ALM's 049 radial while on KAS's 134 outbound radial, we will be at NETKA.

We will use ALM because it's more convenient. After passing KAS, change your Nav-1 frequency to 116.4, and your OBI-2 to 049. Leave Nav-2 on KAS and use it to follow the 134 outbound radial. Set your standby Nav-1 frequency to 108.9 for the ILS.

When your OBI-1 needle sweeps inward, you will be at NETKA. Turn left and head 049 towards ALM. Adjust heading as necessary to align with its 149/229 inbound radial, and maintain your course along it using Nav-1 for guidance. Reset your OBI-2 to 181 for determining your position at the next fix, which is D12 SUP. Be sure your DME is reading from Nav-2 so you can determine the distance to SUP. Descend to 2,500 MSL, which is the specified entry altitude for this instrument approach. Adjust your altimeter for local pressure, and switch to the fuller of your fuel tanks.

When your OBI-2 CDI sweeps inward again, you will be at D12 SUP. Be prepared for your left turn onto the localiser beacon. Switch your Nav-1 radio to the ILS frequency (108.1) and align with its localiser. For approach details, refer to the IAP for this runway – Malmo NDB ILS Rwy 35.

As you intercept the glideslope, begin descending towards the runway, and follow the localiser and glideslope to the threshold.

Land at Malmo

If you've done everything properly, you should see the runway environment for Sturup's 35 ahead of you, and be able to land normally at Sturup airport. If you don't see it when you reach the decision point, execute the missed approach shown on the chart.

Congratulations

You have successfully aborted a planned landing and landed at an alternate airport. Good show, indeed. See you next time. ■

Bill Stack

Our authors

Bill Stack is an expert flight simmer and author of several popular flight sim books. Nels Anderson, our technical consultant, is a certified pilot and president of FlightSim.com. Learn more about flying like a real pilot from Bill Stack's flight sim books at www.topskills.com/flitsim.htm.

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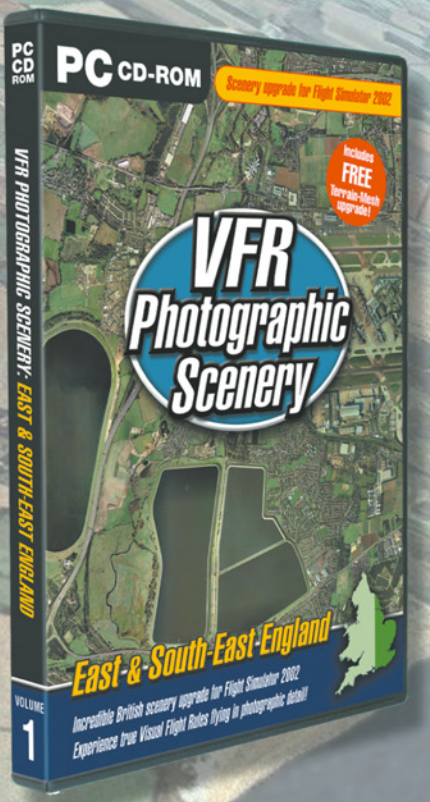
VFR Photographic Scenery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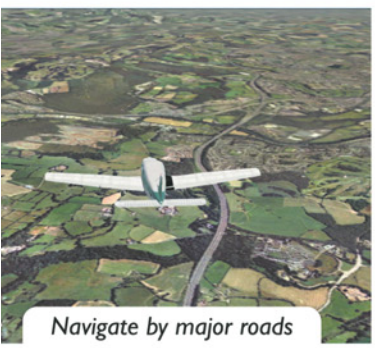
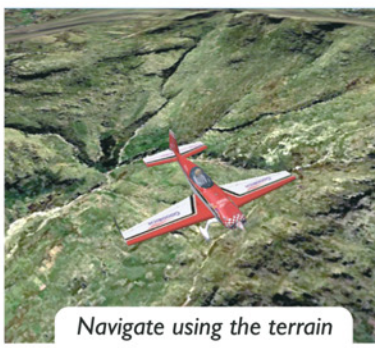

Navigate by major roads

Windsor & the Castle

Goodwood Airfield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Minimum PC specification is quite high since the limits of the simulator are being pushed: Multimedia PC with Pentium III 700 MHz (equivalent or higher) processor. Graphics card with 16MB (or higher) video memory, 3D hardware acceleration and DirectX 8.0A compatible drivers. Operating System: Windows 98, ME, 2000, XP (as supported by MSFS2002). 64MB RAM (128MB for Windows 2000 and Windows XP). Super VGA monitor supporting 800x600 resolution/16-bit colour (or better). DirectX8.0A (or later). Approximately 650MB free space on hard disk.

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Downloads

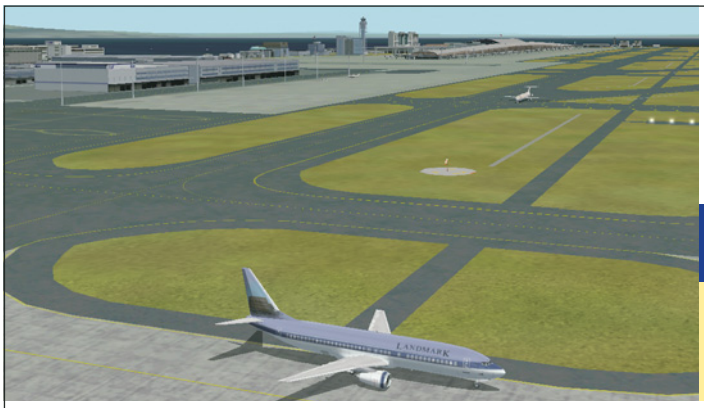
Star performers from the Internet

The Star Download in each issue is awarded to a file that stands out from its contemporaries, either as a particularly good example of the designer's skill or because it really is something a bit special. If you've downloaded or designed a file of any type which you think is worth sharing, please drop us a line.

While many of us enjoy the luxury of broadband downloads, we realise that not everyone has similar access, if indeed any at all, to the Internet; we hope that these files will nonetheless allow you to enjoy some of the excellent freeware downloads available.

Unfortunately we were unable to get permission to include three of this issue's recommended downloads on the cover CD. Nonetheless we are happy to recommend them to you as some of the files we've really been enjoying over the last couple of months.

Our grateful thanks to those authors who were kind enough to let us include their work on our cover CD. If you enjoy a particular file, take a minute to drop the author a line of thanks – they deserve it.



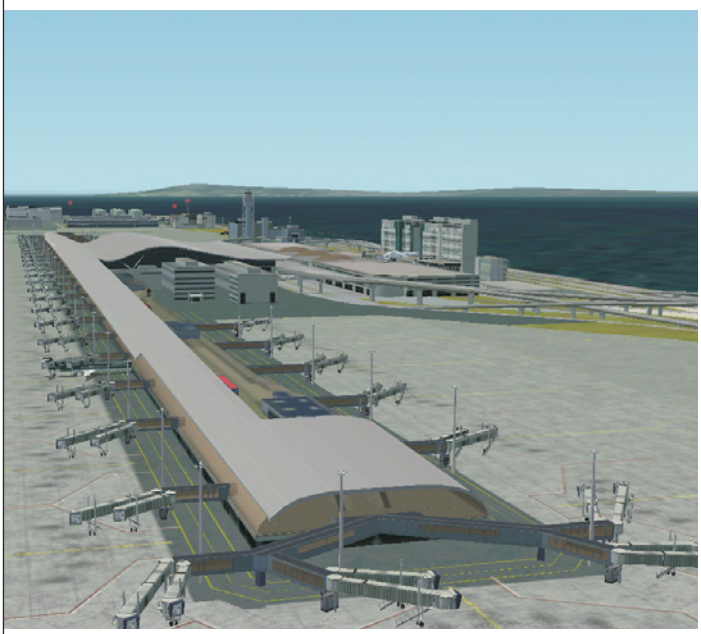
Dry land... but in the ocean

Kansai Airport

Scenery

Flight Simulator 2002

Author: Kazuhiro Miyazaki
Website: http://flightinfo.ens.ne.jp/sfs



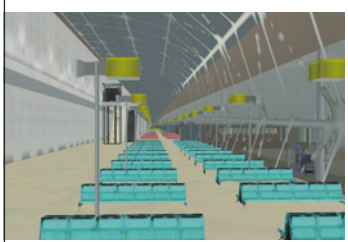
Kansai's famous wing-shaped terminal

Our Star Download for this issue is something a little different, in that it's the first time we've given this award to the rendition of just a single airport, but the author has done a particularly remarkable modelling job in bringing the famous airport at Kansai into the FS world. Kansai airport is famous for the way it was built and, to some extent, for the architect chosen to design and oversee its construction. Perhaps those with satellite TV, and fans of the Discovery channel in particular, will recall the documentary series that covered the whole project.

The airport was designed by the Italian Renzo Piano, and built in 1994 on an artificial island situated off the coast of Japan near Osaka. The structure is both innovative in its design and unique in the construction method used. Because of constant settlement as a result of its unusual location, the major supports for the main terminal are fitted with enormous hydraulic jacks. These are adjusted automatically by computer on a daily basis to keep the massive wing-shaped roof free from stress. As you will see from the images, it's an impressive architectural achievement.

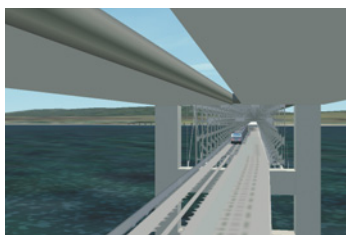
This FS2002 version has been modelled by Kazuhiro Miyazaki and finished to a standard that even surpasses the vast majority of commercial products. The awesome detail both in and around the terminal area extends to hundreds of seats and check-in desks scattered throughout the main hall. You'll find boarding gates, air bridges, lights, signs, and even a shuttle train crossing the causeway from the mainland and a cargo ship berthed in the man-made harbour. Every object really is modelled to the highest possible standard, given the constraints of current hardware technology – an outstanding feat of modelling for an exceptional airport. ■

Joe Lavery



It's usually busier than this!

Don't overshoot the runway



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Author: Alain Capt/ACSoft
Website: www.acsoft.ch

BAe 146-300
Jet Aircraft

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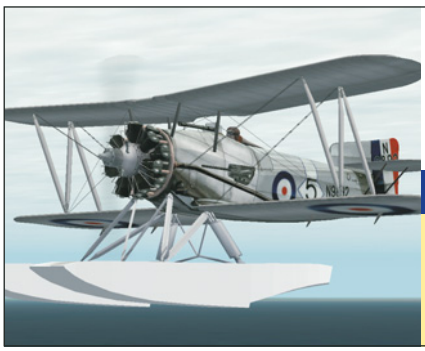
Author: Jon Murchison
Website: http://arnz.myhost.co.nz

Tiger Moth Collection
Prop Aircraft

Flight Simulator 2002

Author: John Woodside
Sounds: Mike Hambly



Fairey Flycatcher Floatplane
Prop Aircraft

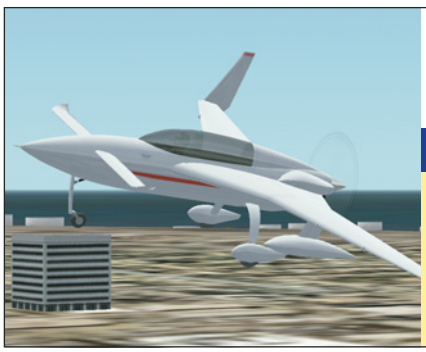
Flight Simulator 2002

Author: Frank Elton (Pegasus Aviation)
Website: www.flightsimnetwork.com/pegav

Iberia Learjet
Jet Aircraft

Flight Simulator 2002

Author: Jorge Salas
Model: Rick Sasala
Sounds: Aaron Swindle
Dynamics: Al Whitney
Radar gauge: Eric Marciano



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Author: Melvin Rafi
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ITRA ActivePanel Autopilot

What does the panel say?

Of the many different FS add-ons and hardware items that we've looked at over the past year, the most impressive have been those hardware devices that allow a more natural interaction with our flight simulators. Actual switches, knobs, buttons and digital displays will always be much easier to use than those on-screen hot spots that seem to move each time you point the mouse at them.

Now all we need is that 52-inch plasma screen!

The most notable (and affordable) items have, to date, come from the range of modules manufactured in the USA by GoFlight, but an autopilot unit recently provided by the German company ITRA GmbH looks just as if it has been ripped straight out of an A320 cockpit. We're not talking here about a piece of equipment that bears the hallmarks of a unit for the home user; this is a solidly engineered autopilot panel complete with all the LED displays, illuminated push buttons and calibration knobs you'd find on the real thing – yet another fine example of German engineering.

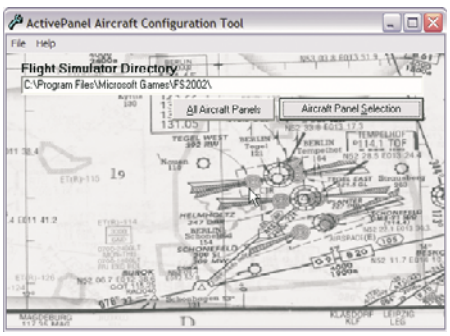
The unit is contained within an aluminium case measuring 16x8x4 inches, with a nicely moulded blue faceplate sporting white legends alongside each of the controls. As you've probably gathered, it's designed to be used in place of the onscreen autopilot panel within any of the FS2002 aircraft, and effectively adds a new gauge to any aircraft you choose.

You have to load a USB driver and the aircraft configuration software before you can use the panel, but this only needs doing once; the program will automatically find the location of FS2002 and register itself in the panels for all your aircraft in one hit, if you prefer. Then it's simply a matter of connecting it to a free USB port, plugging in the power supply and going flying.

The panel features digital displays that represent course, heading, speed, altitude, vertical speed and DME. These have rotary encoders (sounds much better than plain 'knob', doesn't it?) to change the indicated settings, and in most cases they have a secondary function, activated by pushing the associated button. If you set a particular heading, for example, the value will be changed within FS2002; if you push the button alongside the heading display for about a second, you'll activate the heading hold, but this time the display is updated from the value currently shown in Flight Simulator.

In addition to the digital displays there's a row of traditional autopilot buttons covering flight director, auto-throttle, approach, back course, wing leveller and yaw damper; these are also illuminated when active.

Although the panel looks like a piece of equipment designed for the heavy metal brigade, it will work quite happily with any aircraft that makes use of the FS autopilot functions. It's important, however, that the aircraft designers of any add-on aircraft you're using have adhered to the conventions laid down by Microsoft, or else some of the functions might not work. Occasionally, in an effort to get the best out of Flight Simulator, developers change the normal keys and functions you'd find in the default aircraft, which means that the panel will be addressing the wrong variables. In practice we found that the majority of aircraft worked perfectly well.



The Aircraft Configuration utility lets you choose which aircraft are suitable for the panel

The price tells you that this is not a product aimed at the casual flight simmer, but it really is a lovely piece of equipment that's a pleasure to use. As well as increasing the sense of immersion by a few notches, just having this in front of you will make you a better pilot – or at least it'll feel that way. ■

Joe Lavery

Review Score

Publisher: ITRA GmbH

Price: €699.00 (£453.00 approx.)

Website: http://itra.de

Developer: ITRA GmbH

At a glance: Definitive hardware for the ultimate in autopilot functions.

System Requirements: PIII 600MHz, 64Mb RAM, 110Mb hard drive space

Recommended: PIII or Athlon 950MHz+, 256Mb RAM

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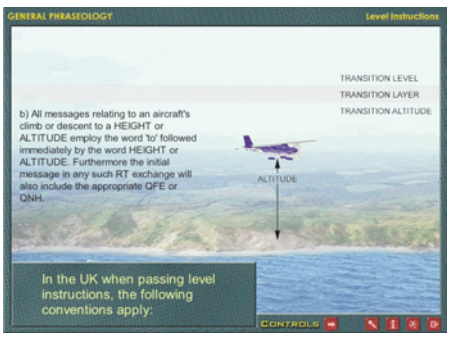
The interactive elements of the CD are spot on; there's no jaw-dropping graphical wizardry on display, just easily navigable interfaces which let you proceed at your own pace, and a feature which lets you record and play back your own attempts at mastering the procedures to see how they match up against the tutor – particularly useful if English isn't your first language. You'll see static or moving diagrams depicting certain procedures, text boxes displaying the spoken dialogue, and interactive flashing radio panels or transmit buttons to let you know whose turn it is to transmit.

See what you've learned in the full VFR flight scenario

If all this sounds rather dull, rest assured that it's not. There really is a wealth of fascinating information here; even if simulation lets us get away with less precise communication, knowing exactly how it should be done is a satisfying feeling, and the controllers at VATSIM will no doubt appreciate your efforts! It's surprising in fact how subjects such as taxi instructions and changing radio frequencies, for example, can become quite so engrossing.


GENERAL PHRASEOLOGY
Level Instructions
TRANSITION LEVEL
TRANSITION LAYER
TRANSITION ALTITUDE
b) All messages relating to an aircraft's climb or descent to a HEIGHT or ALTITUDE employ the word 'to' followed immediately by the word HEIGHT or ALTITUDE. Furthermore the initial message in any such RT exchange will also include the appropriate QFE or QNH.
ALTITUDE
In the UK when passing level instructions, the following conventions apply:
CONTROLS

Procedures for flight level change in the UK VFR Supplement

The UK Airspace Supplement covers those areas of communication where UK requirements differ from those of the ICAO (flight level changes, Military Air Traffic Zones, emergency procedures and so on) and will be of interest to purist UK flyers. If you prefer flying on instruments, then the IFR CD follows on from the VFR tutorial; it complies with ICAO procedures, and again involves you in a complete audio and visual depiction of every imaginable scenario, both on the ground and in the air.

Produced with assistance from the Met Office, Aviation Meteorology is a fascinating lesson in a subject that's of prime importance to every pilot. The Meteorology section runs through the theory and the practical significance of every component of the weather that's relevant to a pilot – pressure systems, turbulence, clouds, precipitation and aircraft icing amongst others. A Flight Briefing module covers METARs, TAFs, weather charts, and how to interpret these data correctly. The final section takes you online to the Met Office website, with a test to see how well you've taken in the information.

NORTH CROSS
GEORGETOWN
RADAR VECTORS - ARRIVING FLIGHTS
Oxbow 342, 14 miles from touchdown. Turn right heading 200, closing localiser from the right. Report localiser established.

Using radar vectors in the IFR CD

The only downside to these instructive and entertaining CDs is their price, which is geared more to the trainee pilot than the flight simmer. If your budget allows, though, and if your level of interest in these subjects warrants it, you'll find they provide a valid education. Windows XP, incidentally, is not listed as a platform on which the CDs will run, but all four ran perfectly under XP Pro on several of our systems. ■

CJ Vanston

Review Score

Publisher: Oxford Aviation Training

Price: VFR £49.75 (UK Airspace Supplement £19.75), IFR £30.00, Aviation Meteorology £54.95 (discounts are available on various combinations of CDs.)

Website: www.oxfordaviation.net

Developer: Oxford Aviation Training

At a glance: Comprehensive, and far more enjoyable than you might expect. The real deal, but at a price.

System Requirements: Pentium 300MHz, Windows 9x/ME/2000, 32Mb RAM

Recommended: PII 500MHz, 128Mb RAM

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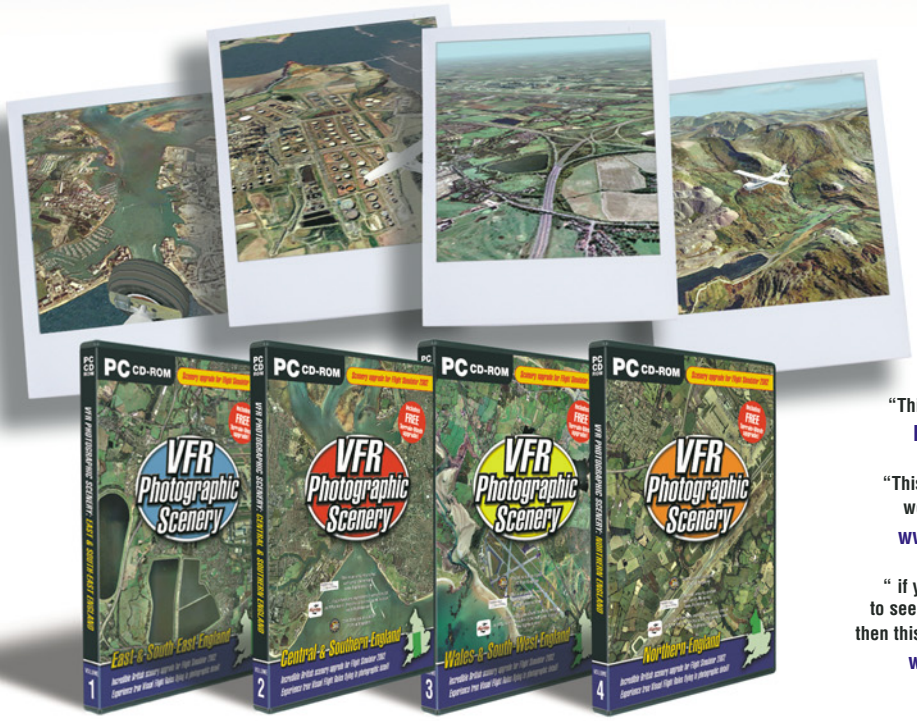

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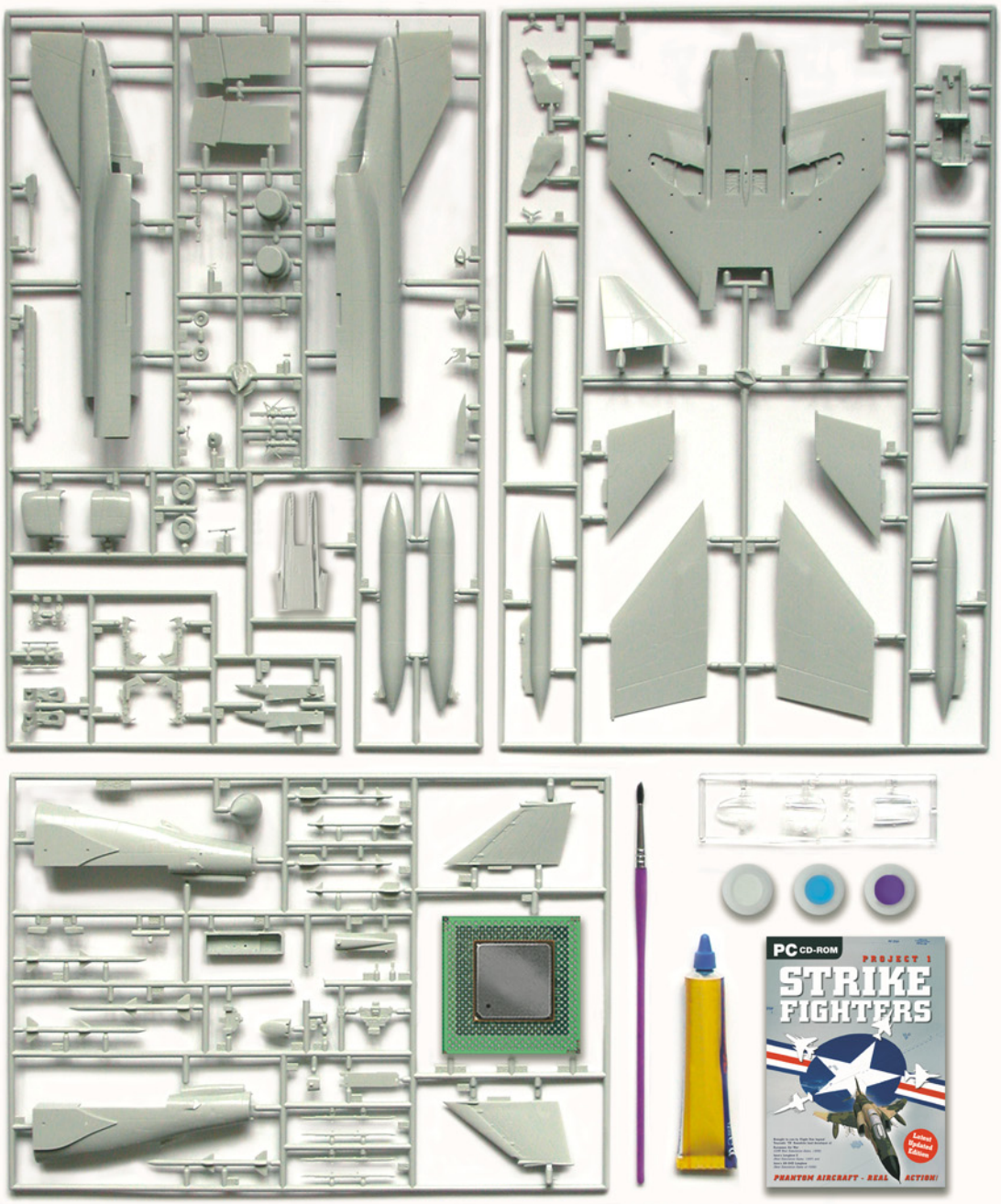
Your 21st century air fix



Traditional combat flight simulation has reached a new level of achievement with Strike Fighters – Project 1. The in-your-face air battles of the 1960s are brought to life with a 21st century graphics engine by Third Wire, led by Tsuyoshi 'TK' Kawahito, who was lead developer of award winning titles such as European Air War (Best Simulation Game, 1998 - CGW), Jane's Longbow 2 (Best Simulation Game, 1997), Jane's Flash Point Korea and Jane's AH-64D Longbow (Best Simulation Game of 1996).

Take on the role of an air force pilot from the generation where skirts got shorter and missiles got deadlier. Fly through a vast campaign where you'll be rewarded for a successful career with medals and promotions. But - hey man - if that's too square, you can become a mercenary pilot and earn bread by destroying targets and completing missions. There's also a cool Single Mission mode that lets you design custom missions for your favourite aircraft and with the groovy Instant Action you can be in the cockpit with a single mouse-click.

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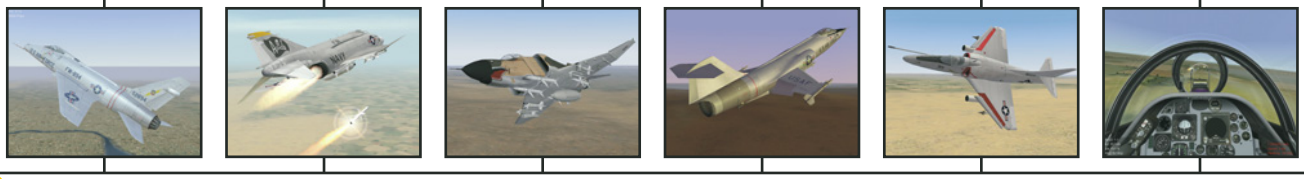

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